Dick Wilcox

the **ARPS**

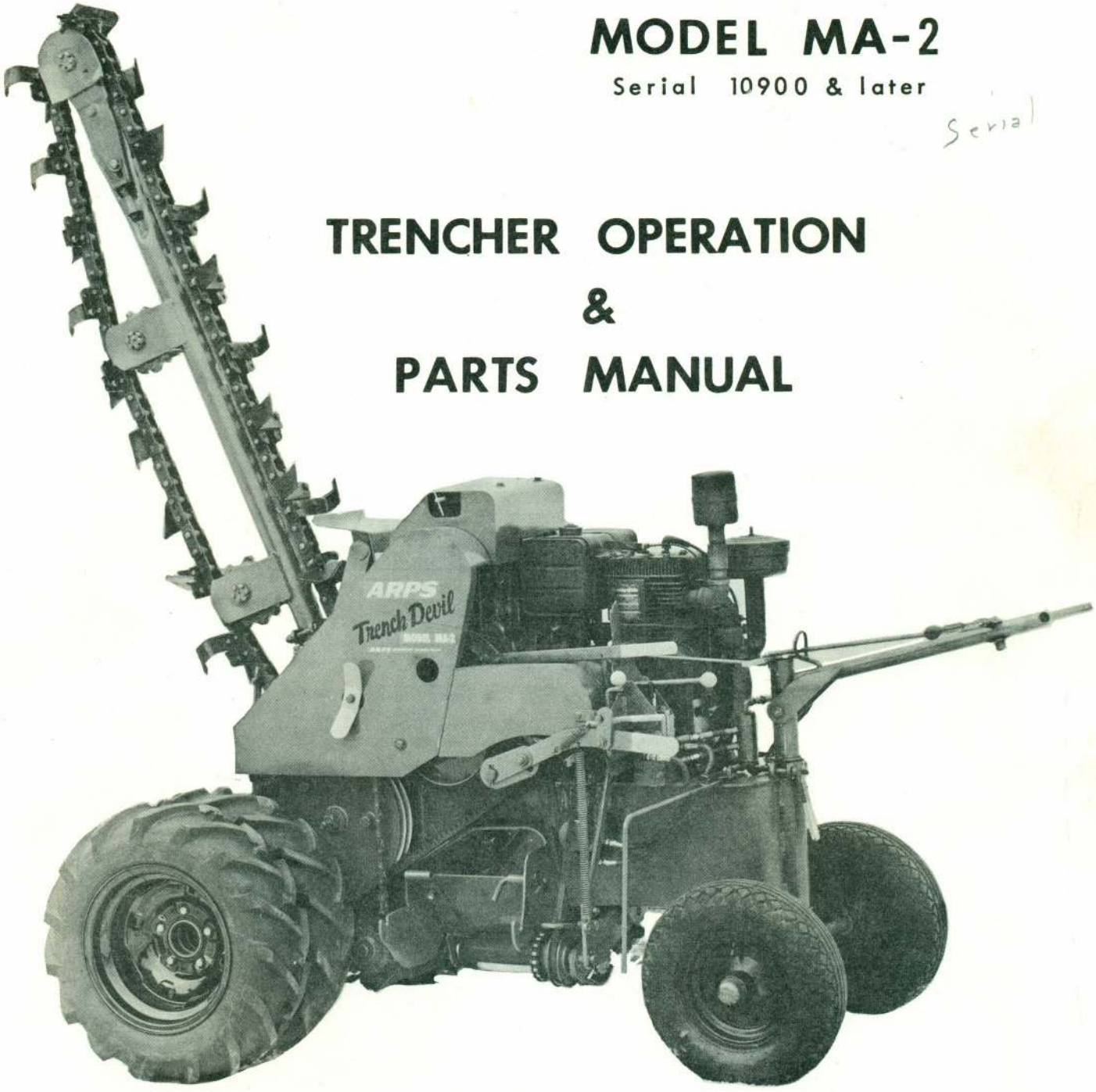
TRENCH-DEVIL

MODEL MA-2

Serial 10900 & later

Serial

TRENCHER OPERATION
&
PARTS MANUAL



ARPS CORPORATION, New Holstein, Wisconsin

Litho in U.S.A.

ASSEMBLY & OPERATION OF THE TRENCHER

Use these instructions in conjunction with the tags found wired to various points of the machine

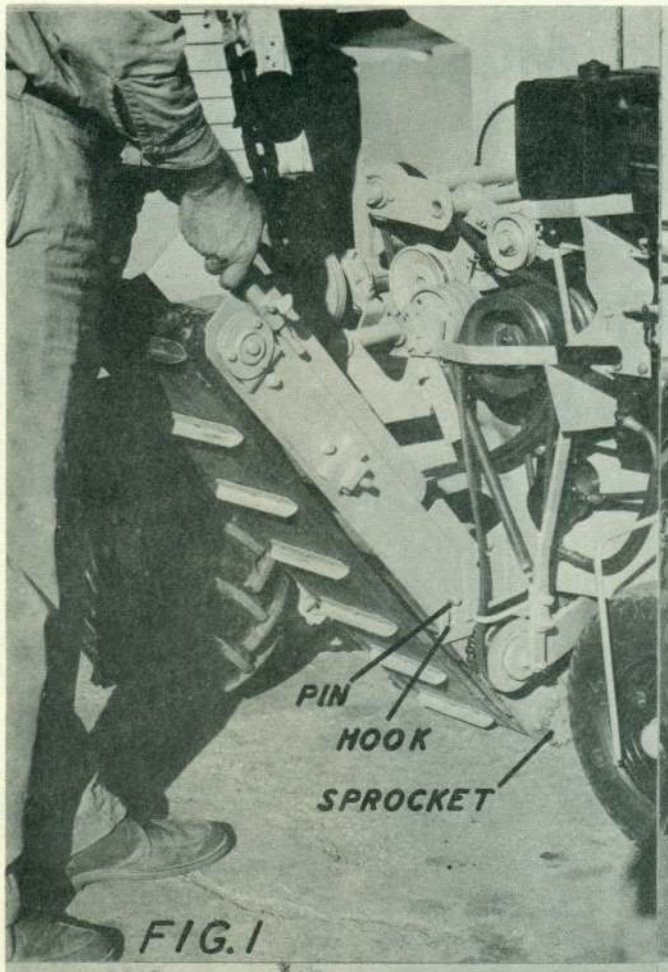


FIG. 1

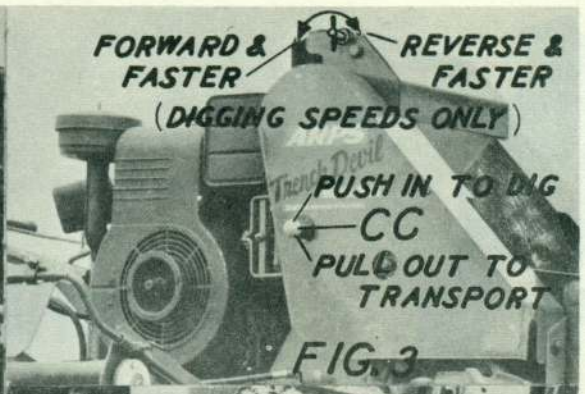


FIG. 3

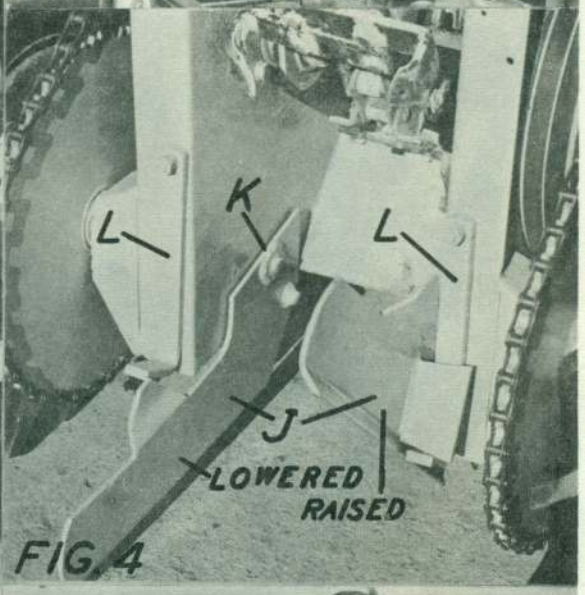


FIG. 4


FIG. 2


FIG. 5

ASSEMBLY

1. Insert boom into boom socket as shown at right with the forward roller on the bottom. Rotate boom back and forth slightly until you feel it seat itself solidly in the socket and aligns itself so that the rollers are perfectly upright. Tighten Clamp Bolts (A) securely.

2. Install cutter chain, making sure that cutting edge is to the front on the bottom segment of chain.

3. Install the cutters on the chain in accordance with the Cutter Charts found several pages farther on in this book. Be sure the sharpened or leading edges of the cutters are facing toward the machine on the bottom side of boom.

4. Tighten chain by turning set screw (B) outward until only a slight sag remains in the chain. Tighten lock nut on set screw and also bolts (C).

5. The conveyor may be set into the machine from either side and can be quickly changed to the opposite side as the need arises. Figure 1 will show how the conveyor is placed into one of its openings in the machine. Note that a pin and hook method is used to support the conveyor. As the conveyor is hung in place, the lower end will swing up so that one of the sprockets on the conveyor will engage a roller chain from the bottom.

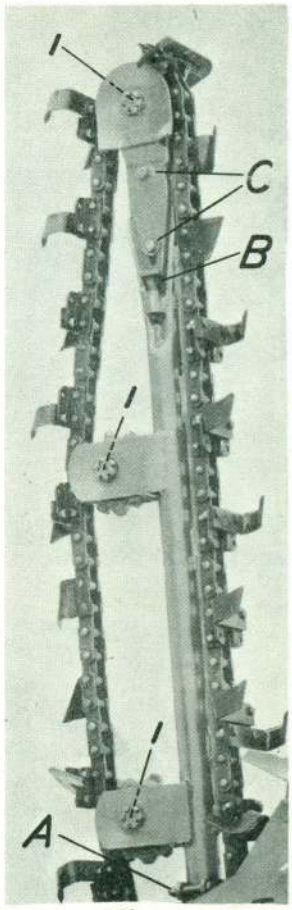


Figure 6.

The proper engagement of the sprocket and the chain is very important. Figure 7 illustrates the drive. Note that the roller chain must be adjusted initially so that the two strands of chain clear each other by 5/8 inch when the conveyor is in place. This is done by adjusting the Idler Sprocket.

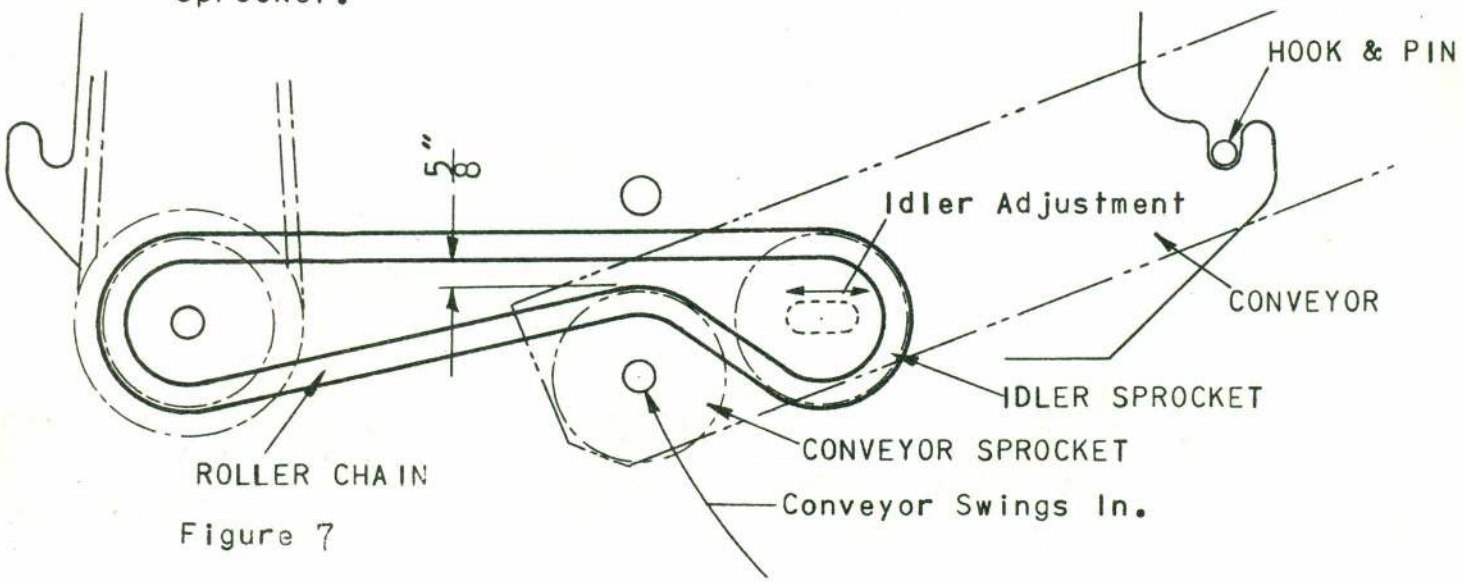


Figure 7

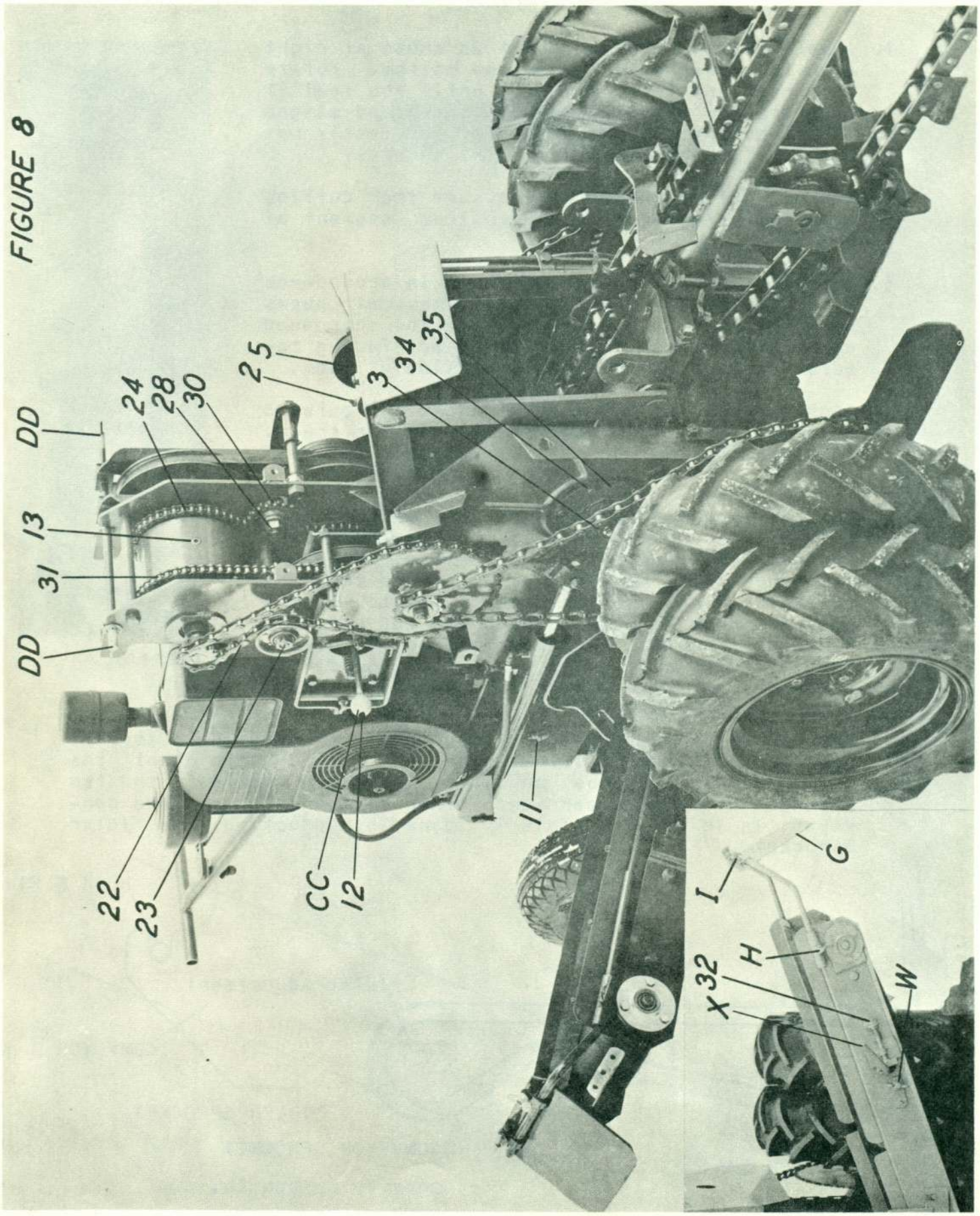


FIGURE 8

When the conveyor is in place, go around to the opposite side. See Figure 9 and adjust bracket (D) so that the conveyor may be locked in place by pin (E) and hairpin cotter (F). Note - When you adjust bracket (D), position it so that the conveyor sprocket does not rest against the drive chain with excessive force, but all or nearly all slack is removed from the chain.

At this time it would be well to repeat this procedure putting the conveyor into the machine from the opposite side. Only second bracket (D-1) on Figure 9 needs to be adjusted for proper chain engagement. When this is done, the conveyor may be changed from side to side without any further adjustments. IMPORTANT - Keep chain adjusted to 5/8 inch clearance dimension so that conveyor sprocket maintains proper engagement. Do not allow any excess slack to develop in drive or unsatisfactory operation will occur.

6. Refer to Figure 8 and install the deflector flap assembly (G) as seen there. Wing screws (H) lock it to the conveyor frame and wing nuts(I) lock the flap to the desired angle for proper placement of the spoil pile as various job conditions are encountered.

7. To install the trench side spill guards (J), refer to Figure 4. The long pin of each guard is inserted into a hole found at (K) on each side of the mud box of the machine. The pin is secured on the opposite side by a hairpin cotter. Hook bar (L) is used to hold the guards up for transport and to prevent the guards from rising when in digging position.

8. The main drive belts were not installed on the machine but were treated with tire talc and packaged in a plastic bag. Do not remove the talc coating but install the belts (R) as illustrated in Fig. 9. Temporarily adjust the belt tension by raising lever (O) until latched, loosening bolt (29) and pushing idler pulley down until belts are snug. Retighten bolt (29). Final adjustment will be necessary when machine is first put into service.
IMPORTANT - These belts were talc coated to reduce their excess grip while fresh and new. Do not re-talc - this belt will condition itself by the time the original application is worn off.

OPERATION OF THE TRENCHER

Refer to Figures 8 and 9 unless told otherwise.

1. Fill engine crankcase and air cleaner with recommended oil. (See engine instruction manual.)

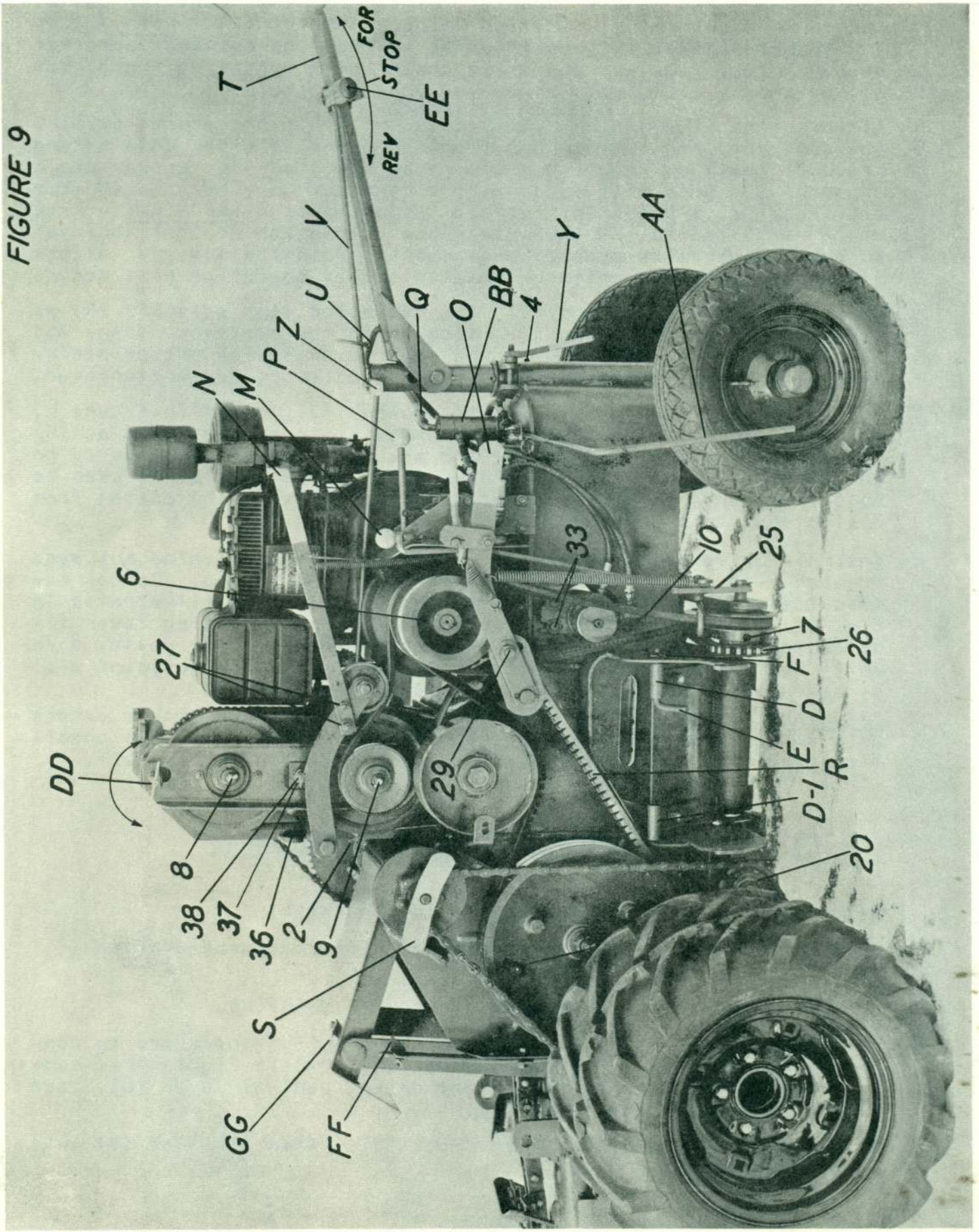
2. Fill fuel tank with good grade of regular gasoline.

3. Before starting engine be sure that V-Belt tighteners are in non-operating position. There are three such V-Belt tighteners; conveyor V-Belt tightener (M), wheel drive control lever (N), and digging chain control lever (O).

4. Raise Handle (T) and lock with Hook (U). Also hook Rod (V) into hole in Lever (Z).

5. Start engine.

FIGURE 9


T
FOR
STOP
REV
EE
V
U
Q
O
BB
4
Y
AA
P
Z
N
M
6
27
33
10
25
7
26
F
D
E
R
D-1
DD
29
8
38
37
36
2
9
S
GG
FF
20

6. Unhook the spill guards (J), Figure 4, and lower them to the ground. They will normally support themselves slightly above the ground level and will ride over any uneveness of the ground.

7. Lower the boom about half way to the ground. To do this, move the valve lever (P) downward. The boom should move downward rapidly, but not fall freely. Fitting (Q) contains a restriction element which prevents this. When desired position is reached, allow handle to spring back to neutral position. To raise boom, lift up on the handle. Should this procedure be reversed from the above described manner, simply reverse hydraulic cylinder hose lines at the shuttle valve (BB).

8. Push conveyor V-Belt tightener(M) down and in to start conveyor.

9. Raise digging chain control lever (O) until latched to start digging chain.

10. Refer to Fig. 3. (Be sure handle (N), Fig. 9, is left in the raised position.) For digging speed range, push knob (CC) all the way in (approximately $\frac{1}{2}$" of travel). Rock the machine slightly forward and backward, if necessary, to facilitate the coupling engagement.

11. Tighten wheel drive friction clutch by tightening large wing nut (S) very tight when machine is set to dig. The loosening of this element permits easier steering when machine is moved in transport drive or maneuvered into digging position.

12. Lower wheel drive control lever (N).

13. Direction and digging speed are controlled by speed control Tee Handle (DD) Fig. 3, which is found on both sides of the machine. The unit must be running before attempting to turn this handle. Turning the handle "forward" will cause the machine to move forward and at an increasing speed as you continue to turn it. Turning the handle "backwards" now will stop the machine and reverse it. It will continue to increase its reverse speed as you turn the handle.

14. To tighten conveyor belt, loosen wing nut (W) and turn tightener (X) clockwise. Do not over-tension. Keep only tight enough to keep conveyor belt running.

15. To transport at speed under its own power, release all drive belts to stop digger chain, conveyor, and wheel drive. Pull knob (CC), Fig. 3, out. If considerable turning will be encountered, release wheel drive clutch wing nut (S). Raise boom and spill guards (J), Fig. 4, to transport position. Throttle engine down to approximately one-third speed. Lower handle (N), Fig. 9, to start drive. The machine will not move. The direction lever (EE), Fig. 9, when pulled forward will cause the machine to move forward. When it is released the machine will stop. When the lever is pushed backward, the machine will move backward. Releasing it again will stop the machine. NOTE:The machine's ability to move over rough terrain, etc.,is directly proportioned to effort applied to lever (EE), up to the point of wheel slippage. You may reverse direction as often and as rapidly as you desire

when maneuvering the machine. Any time you fail to apply force to lever (EE), the machine will come to a stop. This is intended as a safety measure for you - the operator.

16. Practice manipulating all the controls to thoroughly familiarize yourself with them before attempting a trenching job.

17. After familiarity with the controls, you are ready to attempt your first trenching job. Maneuver the machine in position at transport speed. Stop drive by lifting lever (N). Shift knob (CC), (see preceding paragraph 10), all the way in. Tighten wheel drive wing nut (S). Lower boom almost to the ground. Start conveyor and digging chain. Start drive by lowering lever (N), but turn speed control tee handle (DD), Fig. 3, backward or forward until machine does not move. Gradually lower boom into the ground.

NOTE: When you attempt to dig, you will have to adjust the main drive belts for the correct tension to properly handle the machine, but yet slip when the digging chain is stalled or snagged. The slippage should be so controlled by proper belt tension that the engine is stalled gradually, giving the operator time to reach and release lever (O) before the engine quits. This final adjustment should be made by trial when you are actually at the digging site.

After the boom is down to desired depth, start turning the speed control tee handle forward until the engine begins to labor. The throttle may be fully advanced for digging. The front wheels may be locked in a straight ahead position for straight line trenching or in a turned position for digging in a curve. This is done by clamping the spindle at (Y).

The flap at end of conveyor is used to deflect the dirt when digging. It may be set to throw the dirt closer or farther from the machine; or removed as your digging condition requires.

A depth marker is provided, (FF) Fig. 9, which may be set in line with the pointer (GG) when the boom has reached the desired digging depth. After you have raised the boom to clear an obstruction, lower the boom until the pointer and marker align. You are then back to the desired depth.

Under adverse traction conditions, wheel weights (100 lbs./pr) may be added to the rear wheels and/or the rear tires may be loaded with Calcium Chloride and water, which will add approximately another 100 lbs. of weight. Dual wheels may also be installed.

A crumbing attachment (Figure 5) is available when clean trench bottoms are essential.

A guide line tracer (AA) is provided on the machine to allow accurately positioned and extremely straight trenches to be dug for such things as building foundation walls, where concrete is poured directly into the trench, etc.

For truck or trailer transport, the machine is capable of loading itself. Refer to Figure 2. Loading planks with some auxiliary traction cleats should be made up. IMPORTANT - When load-

ing or unloading, always use slow digging speeds. Never use transport speed. Also, be sure that wheel drive wing nut (S) is well tightened so that both wheels drive. The machine may be loaded either forwards or backwards. Always have boom raised as high as possible. Since the weight distribution of the machine is not so advantageous for forward loading (opposite to that shown in Figure 2), the operator should add some weight to the machine by bearing down on the handle as he leads it up the incline. When unloading, simply leave the digging speed drive engaged as the machine goes onto the incline. The machine cannot over-speed the drive mechanism when it reaches the steepest part of the incline.

18. Tire Pressures
    Rear - 8 lbs. without wheel weights, 10 lbs. with wheel weights, and/or crumber.
    Front - 30 lbs.

LUBRICATION

Grease twice daily at (1) (all boom rollers) on Figure 6.

Grease twice daily at (2), (3), (7) on Figures 8 and 9.

Grease twice daily at (8) and (9), Figure 9, and operate the sheaves through their full range of movement at each greasing.

Grease weekly at (4), (5), (6), (12) on Figures 8 and 9.

Pack front and rear wheels every 6 months.

Oil threads of Speed Control Rod (DD) occasionally.

Change oil in gear housing of the Speed Control Drive once each month or two months depending on amount of service. Use SAE 80 gear oil. Fill one-half full, no more, and check supply once weekly. Filler and drain opening is shown at (13) on Figure 8.

Drain Hydraulic Lift System and refill monthly as follows:
For temperatures above 40°F - SAE 10W30 motor oil.
For temperatures below 40°F - SAE 5W20 motor oil.
Fill to level of filler opening. Check oil level frequently. The drain is found at (10) on Figure 9 and the filler plug is found at (11) on Figure 8.

For engine lubrication refer to engine instruction manual.

ADJUSTMENTS

1. The Main Drive Belts are adjusted for running tension by first putting the drive in released position. Loosen bolt (29) and lower handle (O) just slightly. Retighten bolt (29) and try drive. Drive should just slip enough that when the digger chain is snagged or stalled, the operator has a brief moment to reach handle (O) and release the drive before the engine quits. IMPORTANT - New drive belts should be powdered with tire talc once, just prior to placing on the machine. This will reduce the excessive grip and prevent damage or belt breakage, because of failure of the belts to slip when they should. No repeated application is necessary.

2. The Conveyor V-Belt is adjusted for tension by adjusting the position of the slotted bar that is bolted to the lower end of the control bar as indicated by (25) on Figure 9. To replace the V-Belt, disconnect the roller chain (26), Fig. 9, at its parting point. Replace belt and reconnect the chain.

3. The Conveyor Drive Chain should be adjusted in accordance with Figure 7 and paragraph 5 under assembly instructions.

4. The Dirt Moving Belt of the conveyor is tensioned by cam handle (X), Figure 8. Loosen wing nut (W) next to the handle and rotate the handle clockwise. Lock again with wing nut. Only sufficient tension should be maintained so that the drive roller will not slip inside of the belt.

   Adjustment (32), Figure 8, on conveyor is used only for the purpose of getting the two conveyor rollers exactly parallel with each other during assembly or major rebuilding of the conveyor. It should not be disturbed unless the belt persists in running to one side, which indicates that the rollers are not parallel with each other. Careful measuring from end of lower roller shaft to end of upper roller shaft first on one side of the conveyor, and then on the other side will show how much they are out of alignment. Adjust (32) until the two sides measure alike.

5. The Hydraulic Lift V-Belt must be kept sufficiently tight so that it cannot slip. Loosen bolts (33) and slide pump downward until the belt is tight. Retighten bolts.

6. When the Transport & Digging Speed V-Belt wears to the point that control handle (N) begins to rub on the engine pulley, loosen the bolts (27), Figure 9, and pivot handle upward so that it again clears by approximately 3/4". Retighten bolts to clamp handle in place.

7. To Replace Digger Chain Sprocket. Remove the digger chain from the machine. Lower boom to ground. Remove the six bolts from the sprocket and shaft flanges. Remove only the nuts and lockwashers from the six bolts indicated by (34) on Figure 8. Pull the bearing and shaft assembly (35) back as far as necessary (do not remove entirely or disassemble anything additional) to release the sprocket from between the shaft flanges. Note - this is a divided shaft and the sprocket is bolted between the end flanges. Replace sprocket and reassemble in reverse procedure. Be sure that the sprocket bolts are especially tight with no dirt or foreign matter between the flanges and sprocket.

8. The Wheel Drive Chains are adjusted by loosening bolt (20), Figure 9, and sliding the sprocket forward until the chain has the excess slack taken out. Retighten the bolt so that the sprocket cannot shift back. Do not over-tension chain.

9. The Output Chain (22), Figure 8, is adjusted by loosening bolt (23) and sliding the idler roller back to take up the excess slack. Do not over-tighten. Retighten bolt (23) to maintain adjustment.

10. The Primary Input Chain (24), Figure 8, which serves to rotate the transmission case when the drive unit is set for digging speeds,

is adjusted by loosening bolt (28) and sliding the idler sprocket (30) in to remove excess slack. Retighten the bolt.

The Secondary Input Chain (31), Figure 8, which serves to rotate or stop the transmission case when the drive unit is set for transport speeds, has no adjustment provided as it is intended to run on pre-determined fixed centers.

11. The Variable Speed Drive Belt (36), Figure 9, is tensioned by loosening the locknut (37); (note- the nut has left hand threads; turn it in the opposite direction than that of a standard nut). Turn screw (38) clockwise the necessary amount and lock again with the locknut. Caution - do not over-tension, but maintain sufficient tension to adequately drive the machine. See "Trouble Shooting Section", if you have the belt tensioned and the unit seems to be slipping or failing to drive properly.

    To change the Variable Speed Drive Belt, see "Speed Control Repair Instructions Section".

12. The Shrouds are removed by first removing the small hood at the top of the Speed Control Transmission. It is held there by three bolts. Be careful not to disturb the speed control screw, so that its initial setting or adjustment is not lost. The shrouds are held on to the machine by five bolts; one bolt is on each side at the rear, one bolt is at each side, and one bolt is in the center of the rear vertical panel between the shrouds. The wing nut (S), Figure 9, must be removed also.

TROUBLE SHOOTING

A. SPEED CONTROL TRANSMISSION

* Erratic movement. This can come from two sources; variable drive Vee Belt becoming too loose (do not over-tension!) or dirt is packing into the wheel drive chains. When the drive is intermittent or uneven, it usually is found that the wheel drive chains are very tight from mud packing into the sprockets. Clean chain and sprockets and keep them a little looser.

* Insufficient speed range. Variable drive belt has stretched or is too long. Too much variable range has been used to tension belt. A short belt will do likewise. Replace belt.

* Difficult to change speed in digging range. Look out - trouble ahead. The sheave hubs are slowly freezing to their shafts through fretting-corrosion causing a dark brownish deposit of iron oxide between the hub and the shaft. Insufficient greasing and failure to run sheaves through entire range of speed after each greasing, several times to distribute grease properly, is the fault. At early stages, very frequent greasings and movements will clear the deposits; otherwise, disassembly and cleaning will be necessary.

B. HYDRAULIC LIFT SYSTEM

* Low oil level will cause erratic, slow, or stoppage of movement.
* V-Belt slippage will cause erratic, slow, or stoppage of movement.
* When depths cannot be held, change cylinder packings. If trouble persists, change shuttle valve (BB), Figure 9.
* Replace Hydraulic Pump when oil pressure falls below 1000 psi at full engine speed.

C. CONVEYOR

* Cleats on dirt moving belt begin to catch in opening as they go through into the dirt hopper. A deposit of soil is building up on the conveyor rollers, making their diameter larger. Clean off rollers and adjust scrapers close to rollers again to keep them clean.

* Drive chain skips over conveyor sprocket occasionally with a rattling noise. Adjust chain in accordance with Figure 7 at the beginning of this book.

* Drive Vee Belt tears for no apparent reason. Conveyor belt is too tight and will not allow roller to slip inside, or belt has climbed out of groove of engine pulley when drive is released. Vee Belt drive is then too loose.

D. POOR DIGGING RESULTS

* Hard, compact soils, mildly abrasive to abrasive.

  Wrong cutter equipment. Slicer type cutters will wear off leaving a rounded edge for cutting, which slides over the soil like a runner. Use chisel type cutters. Cleaner blades sometimes are a necessity in bringing up the fine, pulverized soil.

  Too long a boom on the machine. Shallow depths, long booms, and hard soils do not work well together. Excessive down pressure is required to force the cutters down against the soil. Rear wheel traction is greatly reduced by applying machine's weight to cutters. Cutters tend to pull machine backwards as wheels with reduced traction try to move machine forward. Use shorter boom so boom is kept more vertical rather than horizontal. This adds traction to wheels and machine has fewer cutters to force into the soil at any one time. Cutting action will be faster with less wear for all parts.

  Hard surfacing of cutters for greater wear life can be done. This is looked upon as a local condition, and local experiences as to material and application techniques will vary from area to area. Do not electric weld hard surfacing material to cutter. Always use an acetylene gas torch for applying hard surfacing.

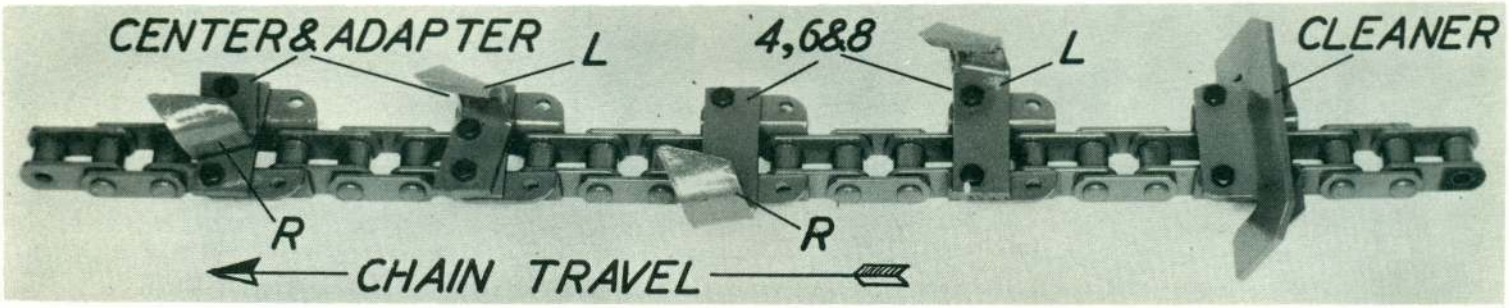
* Stony soils. Either slicer or chisel cutters may work here, or they may be mixed; but use the widest set-up (8"), because the machine can bring up more stones for you. The boom also has more "drift" space and can force itself past large side wall imbedded stones. Use the shortest boom possible again to eliminate dragging the machine backwards as it catches on to the stones. Cleaner blades will help bring up the smaller stones which tend to roll alongside the cutter chain.

* Soft, moist, easy cutting soils. Slicer type cutters work best here. Boom length is not so critical nor is the trench width, unless the soil is excessively wet. Then the wider trench works better. Cleaner blades are often useless in good cutting, moist soils. Dry soils, which pulverize easily, will require cleaner blades to bring up the fine particles.

* Narrow, deep trenches are a troublesome nuisance to any trencher. Avoid them whenever possible. Contrary to popular belief, narrow, deep trenches consume more digging time than wider trenches of the same depth. Reserve your narrow digging to shallow trenches and use the shortest boom length possible.

SLICER CUTTER SET-UP

This is a knife type cutter bent to a hook shape. Its cutting action is similar to that of a knife in that it cuts or slices the soil away. It works well in clear to medium rocky soil, from a moist to a sticky wet condition, and in frost up to a maximum of approximately 1½" to 2" deep. It is not generally considered a good cutter for very stony soil; hard, dry, well packed soil; or very hard, abrasive soils.



Select your Boom length and desired trench width. Read down column.

1½' (No.20) Boom			2½' (No.30) Boom			3½' (No.40) Boom			4½' (No.50) Boom		
4"	6"	8"	4"	6"	8"	4"	6"	8"	4"	6"	8"
CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR
CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL
4R	4R	4R	4R	4R	4R	4R	6R	4R	4R	4R	4R
4L	4L	4L	Empty	4L	4L	4L	6L	4L	4L	4L	4L
Empty	Empty	8R	4L	6R	Empty	Empty	4R	6R	Empty	Empty	8R
4R	6R	8L	Empty	6L	6R	4R	4L	6L	4R	6R	8L
4L	6L	Cleaner	4R	4R	6L	4L	6R	8R&8L	4L	6L	Cleaner
CR	CR	CR	Empty	4L	8R	Empty	6L	Cleaner	CR	CR	CR
CL	CL	CL	4L	6R	8L	CR	CR	CR	CL	CL	CL
4R	4R	6R	Empty	6L	Cleaner	CL	CL	CL	4R	4R	6R
4L	4L	6L	CR	CR	CR	4R	6R	4R	4L	4L	6L
Empty	Empty	8R	CL	CL	CL	4L	6L	4L	Empty	Empty	8R
4R	6R	8L	4R	4R	4R	Empty	4R	6R	4R	6R	8L
4L	6L	Cleaner	Empty	4L	4L	4R	4L	6L	4L	6L	Cleaner
			4L	6R	Empty	4L	6R	8R&8L	CR	CR	CR
			Empty	6L	6R	Empty	6L	Cleaner	CL	CL	CL
			4R	4R	6L	CR	CR	CR	4R	4R	4R
			Empty	4L	8R	CL	CL	CL	4L	4L	4L
			4R	6R	8L	4R	6R	4R	Empty	Empty	8L
			Empty	6L	Cleaner	4L	6L	4L	4R	6R	8R
						Empty	4R	6R	4L	6L	Cleaner
						4R	4L	6L	CR	CR	CR
						4L	6R	8R&8L	CL	CL	CL
						Empty	6L	Cleaner	4R	4R	6R
									4L	4L	6L
									Empty	Empty	8L
									4R	6R	8R
									4L	6L	Cleaner

CR - Denotes Center type Cutter and Adapter, R.H.

CL - Denotes Center type Cutter and Adapter, L.H.

4R, 6R, 8R - Denotes Bolt on Cutter for that width of trench, right hand.

4L, 6L, 8L - Denotes Bolt on Cutter for that width of trench, left hand.

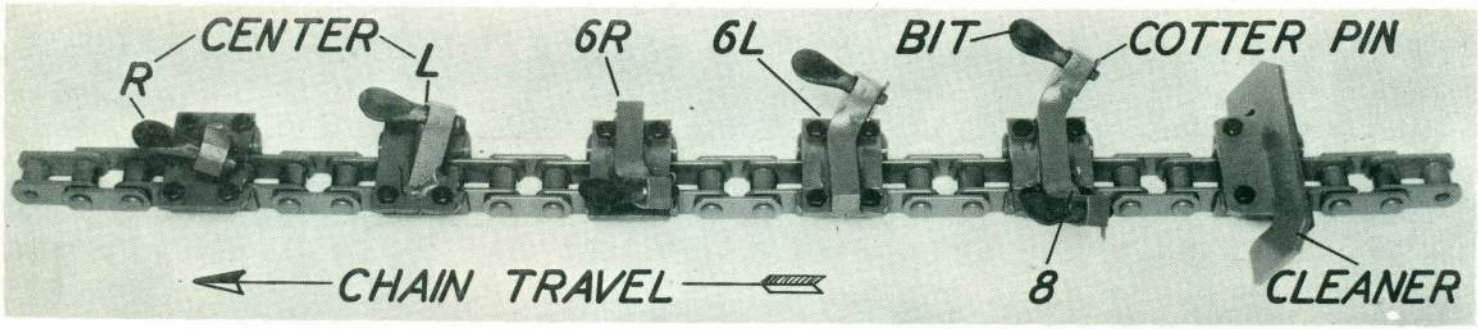
Cleaner - Denotes Cleaner Blade (for 8" trench only).

Note - All spaces are not always filled by Cutters. Also, note that the Cutter Chain is assembled in sequences and that the Center Cutters are the beginning of each Cutter sequence. These Slicer Cutters may be interspersed with Chisel type Cutters, if soil conditions warrant such simultaneous use.

ARPS CORPORATION, New Holstein, Wisconsin

CHISEL CUTTER SET-UP

This is a chisel bit type cutter pointed in the direction of the line of action. It is a digging action of picking, scraping and tearing the soil loose. It is a good cutter for hard soils, abrasive soils, medium to very stony soils and some frozen soils. It is not a good cutter for soft, wet, sticky soils, or certain soils which pack easily.



Select your boom length and desired trench width. Read down column.

$1\frac{1}{2}$' (No.20) Boom

4"	6"	8"
CL	CL	CL
CR	CR	CR
4L	4L	4L
4R	4R	4R
CL	6L	6L
CR	6R	8
-	-	Cle
4L	CL	CL
4R	CR	CR
CL	4L	4L
CR	4R	4R
4L	6L	8
4R	6R	6R
-	-	Cle

$2\frac{1}{2}$' (No.30) Boom

4"	6"	8"
CL	CL	CL
CR	CR	CR
4L	4L	4L
4R	4R	4R
-	-	-
CL	6L	6L
CR	6R	6R
4L	CL	8
4R	CR	Cle
-	-	-
CL	4L	CL
CR	4R	CR
4L	6L	4L
4R	6R	4R
-	-	-
CL	CL	6L
CR	CR	6R
4L	4L	8
4R	4R	Cle

$3\frac{1}{2}$' (No.40) Boom

4"	6"	8"
CL	CL	CL
CR	CR	CR
4L	4L	4L
4R	4R	4R
-	6L	6L
CL	6R	6R
CR	CL	8
4L	CR	Cle
4R	4L	CL
-	4R	CR
CL	6L	4L
CR	6R	4R
4L	CL	6L
4R	CR	6R
-	4L	8
CL	4R	Cle
CR	6L	CL
4L	6R	CR
4R	CL	4L
-	CR	4R
CL	4L	6L
CR	4R	6R
4L	6L	8
4R	6R	Cle

$4\frac{1}{2}$' (No.50) Boom

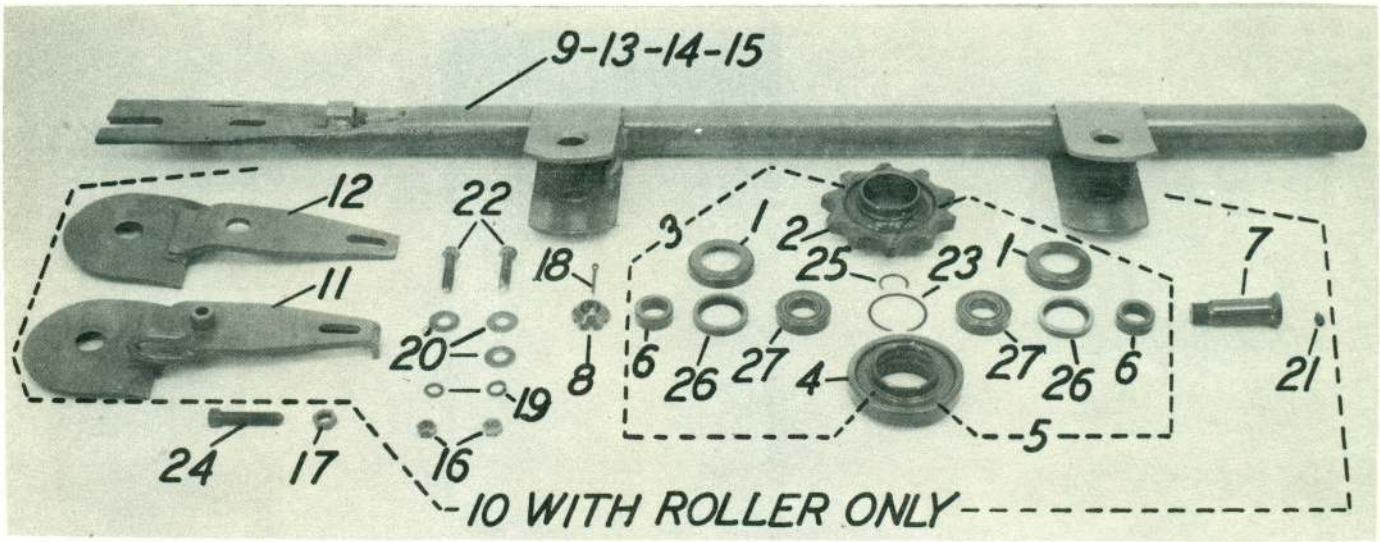
4"	6"	8"
CL	CL	CL
CR	CR	CR
4L	4L	4L
4R	4R	4R
CL	6L	8
CR	6R	Cle
-	-	CL
4L	CL	CR
4R	CR	4L
CL	4L	4R
CR	4R	6L
4L	6L	6R
4R	6R	8
-	-	Cle
CL	CL	CL
CR	CR	CR
4L	4L	6L
4R	4R	6R
CL	6L	8
CR	6R	Cle
-	-	CL
4L	CL	CR
4R	CR	4L
CL	4L	4R
CR	4R	6L
4L	6L	6R
4R	6R	8
		Cle

CR - Denotes Center Bracket, right hand.
CL - Denotes Center Bracket, left hand.
4R, 6R - Denotes 4" or 6" Bracket, right hand.
4L, 6L - Denotes 4" or 6" Bracket, left hand.
8 - Denotes 8" Bracket for that trench width.
Cle - Denotes Cleaner Blade for that trench width.

All Cutter Brackets and Cleaners bolt on to Chain with four bolts (3/8 NFx7/8 Alloy, heat treated).

These Chisel Cutters may be interspersed with Slicer Type Cutters, if soil conditions warrant such simultaneous use.

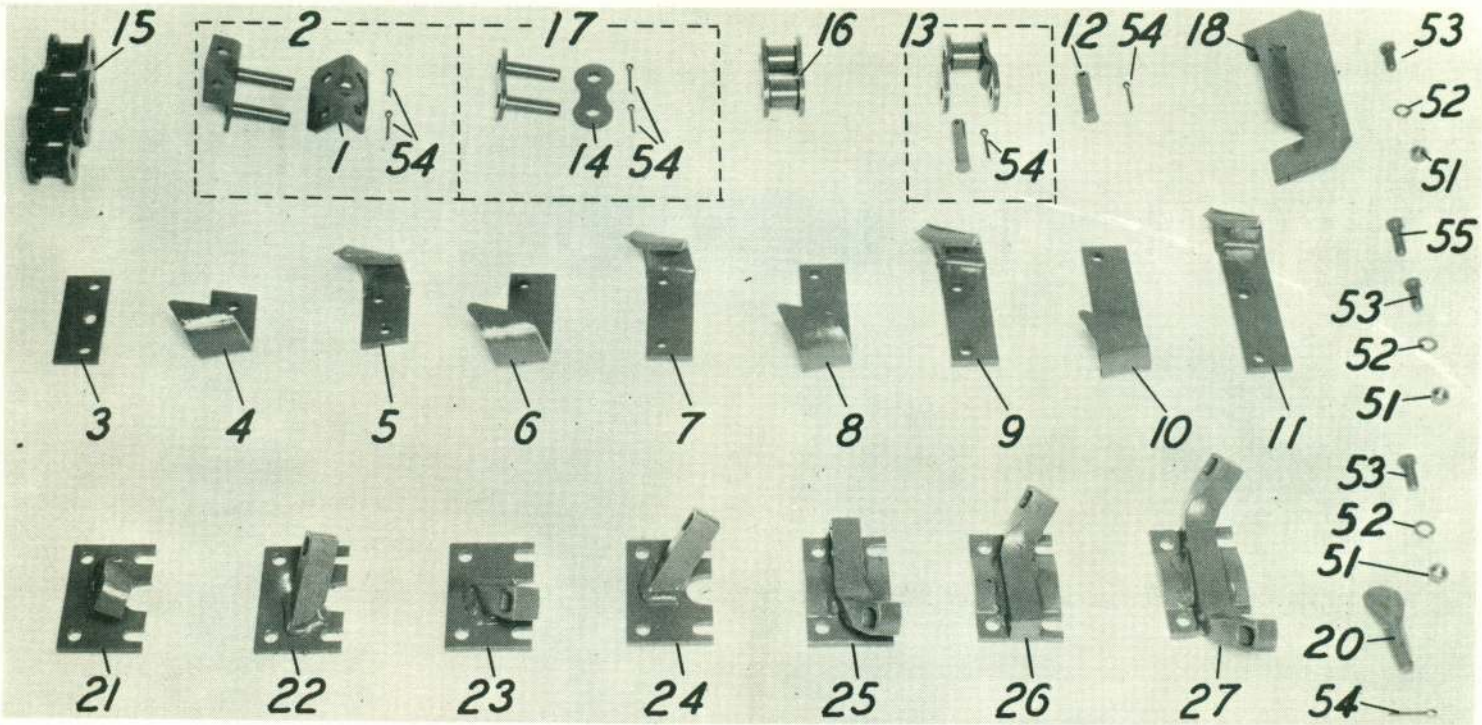
BOOM & IDLER PARTS SECTION



Index No.	Description	Part No.
1	Seal Guard	DJ-222
2	Boom Idler Sprocket, H.D. no bearings, etc.	DJ-2503
3	Boom Idler Sprocket, H.D. w/bearings, seals, seal guards, rings, etc.	DJ-2503A
4	Boom Idler Roller, H.D. no bearings, etc.	DJ-2504
5	Boom Idler Roller, H.D. w/bearings, seals, seal guards, rings, etc.	DJ-2504A
6	Seal Ring	DJ-2505
7	Roller Shaft	DJ-2506
8	Roller Shaft Nut	DJ-2507
9	#40 Boom Weldment, no rollers or tail roller bracket.	DJ-2511
10	Tail Roller & Bracket Complete: includes bracket, rollers, bearings, seals, shaft, etc.	DJ-2531
11	Tail Roller Bracket, R.H. w/stone deflector	DJ-2542
12	Tail Roller Bracket, L.H.	DJ-2543
13	#50 Boom Weldment, no rollers or tail roller bracket.	DJ-2556
14	#30 Boom Weldment, no rollers or tail roller bracket.	DJ-2561
15	#20 Boom Weldment, no rollers or tail roller bracket.	DJ-2566
16	Nut, $\frac{1}{2}$ NC	TDS-40
17	Nut, 5/8 NC, Jam	TDS-46
18	Cotter Pin, 1/8 x $1\frac{1}{2}$	TDS-59
19	Lockwasher, $\frac{1}{2}$	TDS-82
20	Washer, $\frac{1}{2}$ Wrought	TDS-83
21	Grease Fitting, $\frac{1}{4}$ SAE	TDS-93
22	Bolt, $\frac{1}{2}$ NC x $2\frac{1}{4}$	TDS-125
23	Retaining Ring	TDS-284
24	Setscrew, 5/8 NC x $3\frac{1}{2}$, square head	TDS-494
25	Retaining Ring, XR0448 Nat.	TDS-495
26	Grease Seal, 244124 CR	TDS-496
27	Bearing, Ball, Federal 1206 F or equivalent	TDS-497
*	#20 Heavy Duty Boom Ass'y	DJ-2500A-20
*	#30 Heavy Duty Boom Ass'y	DJ-2500A-30
*	#40 Heavy Duty Boom Ass'y	DJ-2500A-40
*	#50 Heavy Duty Boom Ass'y	DJ-2500A-50

* Complete Assemblies (not shown):Includes Rollers,Tail Roller Brkt,Brgs, & Hdwe.

CUTTER & CUTTER CHAIN PARTS



Index No.	Description	Part No.
1	Angle Side Link only	DJ-2601
2	Angle Side Link complete, Includes 2 angle links, 2 pins, 2 cotter pins, assembled	DJ-2601A
3	Center Cutter Adapter Bar	DJL-2602
4	Center Cutter, RH, no bolts	DJL-2603CR
4	Center Cutter, RH, hard surfaced, no bolts	DJL-2603CRS
5	Center Cutter, LH, no bolts	DJL-2603CL
5	Center Cutter, LH, hard surfaced, no bolts	DJL-2603CLS
6	4" Slicer Cutter,RH,no bolts	DJ-2603-4R
6	4" Slicer Cutter, RH, hard surfaced, no bolts	DJ-2603-4RS
7	4" Slicer Cutter,LH, no bolts	DJ-2603-4L
7	4" Slicer Cutter, LH, hard surfaced, no bolts	DJ-2603-4LS
8	6" Slicer Cutter,RH, no bolts	DJ-2603-6R
8	6" Slicer Cutter, RH, hard surfaced, no bolts	DJ-2603-6RS
9	6" Slicer Cutter,LH, no bolts	DJ-2603-6L
9	6" Slicer Cutter, LH, hard surfaced, no bolts	DJ-2603-6LS
10	8" Slicer Cutter,RH, no Bolts	DJ-2603-8R
10	8" Slicer Cutter, RH, hard surfaced, no bolts	DJ-2603-8RS
11	8" Slicer Cutter,LH, no bolts	DJ-2603-8L
11	8" Slicer Cutter, LH, hard surfaced, no bolts	DJ-2603-8LS
12	Pin, Cutter Chain	DJ-2604
13	Offset Link, Cutter Chain	DJ-2605
14	Side Bar, Pin Link	DJ-2606
15	3-Link Section, Cutter Chain, made up of 2 roller links, 1 pin link, riveted	DJ-2607
16	Roller Link, Cutter Chain	DJ-2608
17	Pin Link, Cutter Chain, made up of 2 side bars, 2 pins, 2 cotter pins, assembled	DJ-2609
18	Cleaner Blade - 8"	DJ-2610-8
20	Chisel Cutter Bit,HardenedSteel	DJ-2651
20	Chisel Cutter Bit, Hard surfaced, Hardened	DJ-2651S
21	Center Chisel Cutter Bracket, RH, no bolts	DJL-2675CR
22	Center Chisel Cutter Bracket, LH, no bolts	DJL-2675CL
23	4" Chisel Cutter Bracket, RH no bolts	DJ-2680R
24	4" Chisel Cutter Bracket, LH no bolts	DJ-2680L
25	6" Chisel Cutter Bracket, RH no bolts	DJ-2685R
26	6" Chisel Cutter Bracket, LH no bolts	DJ-2685L
27	8"Chisel Cutter Brkt. no bolts	DJ-2690
*	Cutter Chain,1½', R.D. no bolts	DJ-2625-20
*	Cutter Chain,2½', R.D. no bolts	DJ-2625-30
*	Cutter Chain,3½', R.D. no bolts	DJ-2625-40
*	Cutter Chain,4½', R.D. no bolts	DJ-2625-50
	* not illustrated	
51	Nut, 3/8 NF	TDS-35
52	Lockwasher 3/8	TDS-79
53	Bolt, 3/8 NF x 7/8 H.T. Alloy	TDS-383
54	Cotter Pin, 1/8 x 7/8 Alloy	TDS-384
55	Bolt, 3/8 NF x 1-1/8 H.T.Alloy	TDS-503

HOW TO USE HARD FACED CHISEL CUTTERS FOR MAXIMUM TRENCH CUTTING PERFORMANCE.

Hard faced Chisel Cutters have only one surface hard faced, and it is discernible by the deposit thereon. The Cutter, therefore, has one hard side and one softer side.

There are two methods of us age:

1. Having the hard faced side turned away from the trench bottom, thereby exposing the softer Cutter metal to wear against the trench bottom.

   This generally produces the most satisfactory results by giving the maximum trench footage rate per hour in hard, abrasive soils.

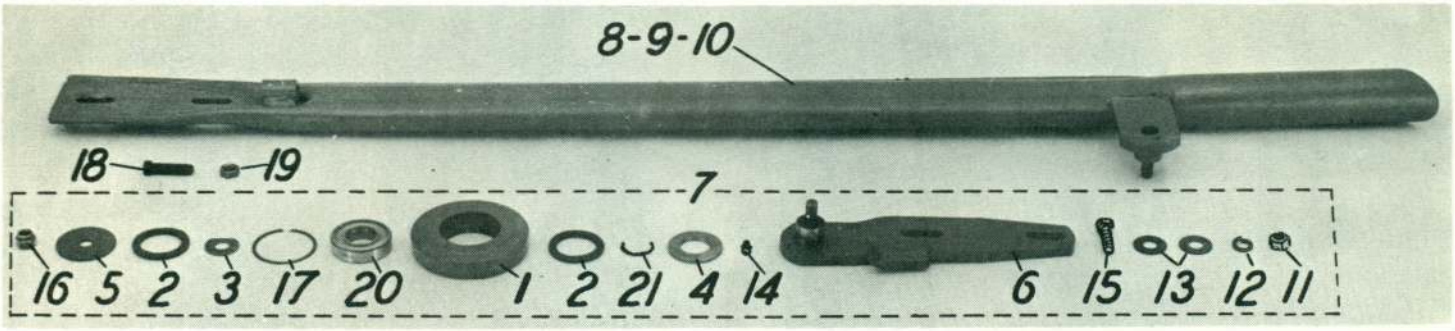
   As the softer cutter metal wears away, the hard metal tends to remain and produces an extremely sharp, hard cutting edge, which cuts away the hard soil rapidly.

2. Having the hard faced side turned toward the trench bottom, thereby subjecting the hard cutter material to the greatest wear by the trench bottom. While this may extend the hourly life of the cutter, the hourly trenching output rate is soon drastically reduced as the cutter becomes blunt. This method works well only where the spoil dirt is abrasive enough to produce a continually sharp cutter.

BOOM & IDLER PARTS SECTION

LIGHT DUTY - NARROW TRENCH SERIES

2 3/4" & 3 1/2" Trench width up to 3 1/2' depth



Index No.	Description	Part No.
1	Roller, Light Duty Boom, Narrow Cut only	DJ-2731
2	Felt Ring	DJ-2732
3	Spacer Washer	DJ-2733
4	Roller Spacer	DJ-2734
5	Roller Washer	DJ-2735
6	Tail Roller Bracket, Narrow Cut, Weldment only	DJ-2740
7	Tail Roller Bracket, Narrow Cut, Complete Roller, Bearings and Hardware	DJ-2740A
8	3½' Narrow Cut Boom, Weldment only	DJ-2780A
9	2½' Narrow Cut Boom, Weldment only	DJ-2785A
10	1½' Narrow Cut Boom, Weldment only	DJ-2790A
11	Nut, ½ NC	TDS-40
12	Lockwasher, ½	TDS-82
13	Washer, ½ Standard Flat	TDS-83
14	Grease Fitting, ¼ SAE	TDS-93
15	Bolt, ½ NC x 2¼	TDS-125
16	Nut, ½ NF, Self-locking	TDS-210
17	Retaining Ring	TDS-284
18	Set Screw, ½ NC x 2, Sq. Hd.	TDS-381
19	Nut, ½ NC Jam	TDS-382
20	Bearing, Ball, Federal 1206 FF or equivalent	TDS-423
21	Retaining Ring, XR0448 National	TDS-495
*	1½' Narrow Cut Boom Assembly	DJ-2700-1½
*	2½' Narrow Cut Boom Assembly	DJ-2700-2½
*	3½' Narrow Cut Boom Assembly	DJ-2700-3½

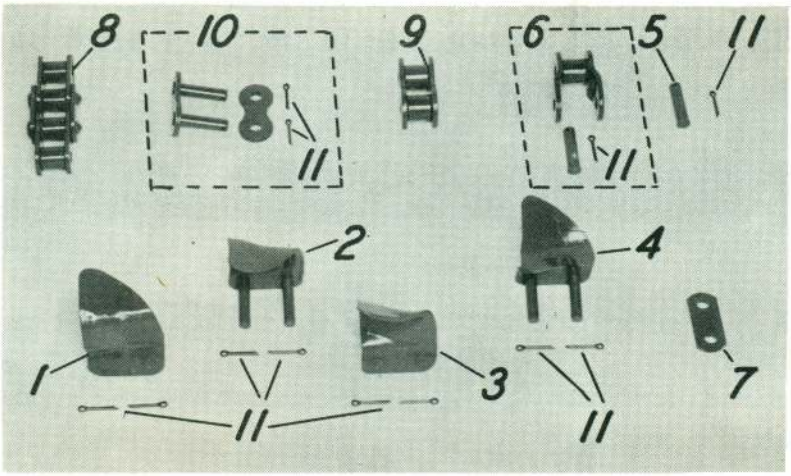
*Complete assemblies ready to use, includes Rollers, Tail Roller Bracket, Bearings, Hardware, etc.

Note: Do not attempt to use wide cutting chain on narrow cut booms. Use only the narrow cut series, 2-3/4" or 3½" cutting width.

CUTTER & CUTTER CHAIN PARTS

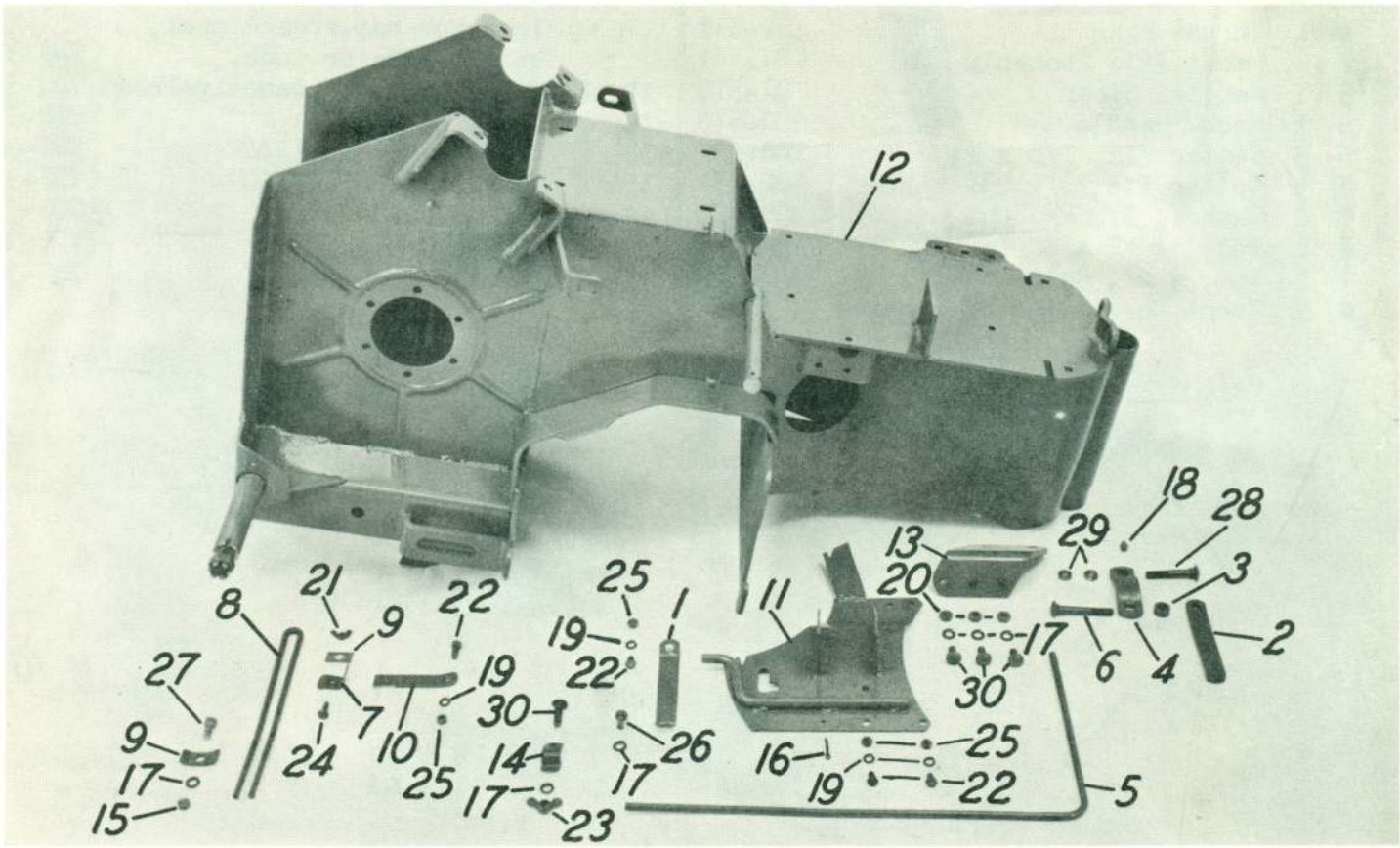
LIGHT DUTY - NARROW TRENCH SERIES

2 3/4" & 3 1/2" Trench width up to 3 1/2' depth

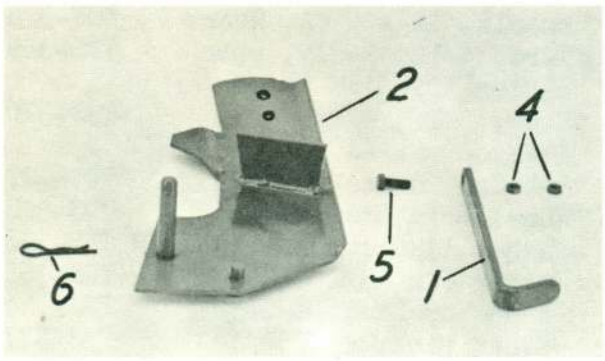


Index No.	Description	Part No.
1	Center Slicer Cutter, RH, hard faced: includes Cutter, Pins, Cotter Pins, only, assembled	DJ-2602RS
2	Center Slicer Cutter, LH, hard faced: includes Cutter, Pins, Cotter Pins, only, assembled	DJ-2602LS
3	3½" Slicer Cutter, RH, hard faced: includes Cutter, Pins, Cotter Pins only, assembled	DJ-2602-3½RS
4	3½" Slicer Cutter, LH, hard faced: includes Cutter, Pins, Cotter Pins only, assembled	DJ-2602-3½LS
5	Pin, Cutter Chain and Cutter	DJ-2604
6	Offset Link, Cutter Chain	DJ-2605
7	Side Bar, Pin Link and Cutter	DJ-2606
8	3-Link Section, Cutter Chain, made up of 2 Roller Links, 1 Pin Link, riveted	DJ-2607
9	Roller Link, Cutter Chain	DJ-2608
10	Pin Link, Cutter Chain, made up of 2 Side Bars, 2 Pins, Cotter Pins, assembled	DJ-2609
*	3½'-2-3/4" Narrow Cutter Chain w/Cutters complete	DJ-2760-2-3/4S
*	3½'-3½" Narrow Cutter Chain w/Cutters complete	DJ-2760-3½S
*	2½'-2-3/4" Narrow Cutter Chain w/Cutters complete	DJ-2765-2-3/4S
*	2½'-3½" Narrow Cutter Chain w/Cutters complete	DJ-2765-3½S
*	1½'-2-3/4" Narrow Cutter Chain w/Cutters complete	DJ-2770-2-3/4S
*	1½'-3½" Narrow Cutter Chain w/Cutters complete	DJ-2770-3½S
	* not illustrated	
11	Cotter Pin, 1/8 x 7/8 Alloy	TDS-384

Note: Narrow cut booms and chains are not recommended for stony, hard cutting soils. Narrow Cutter Chains will work only with narrow cut booms. Above chain includes integral cutters assembled into chain and will cut 2-3/4" and 3½" width trenches respectively.

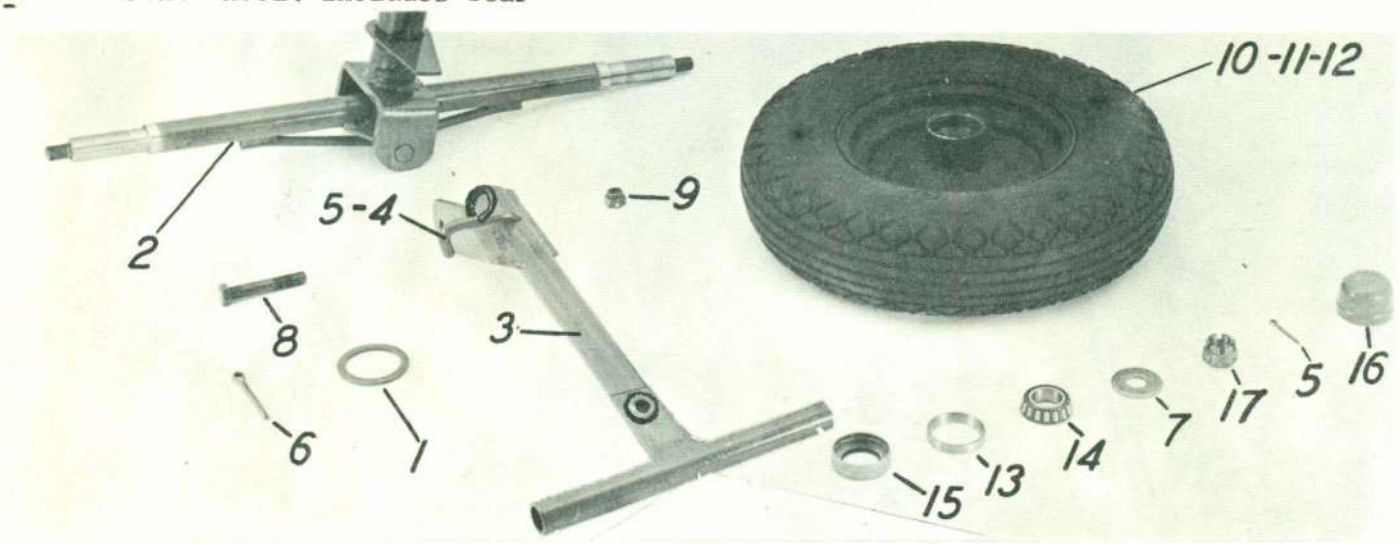


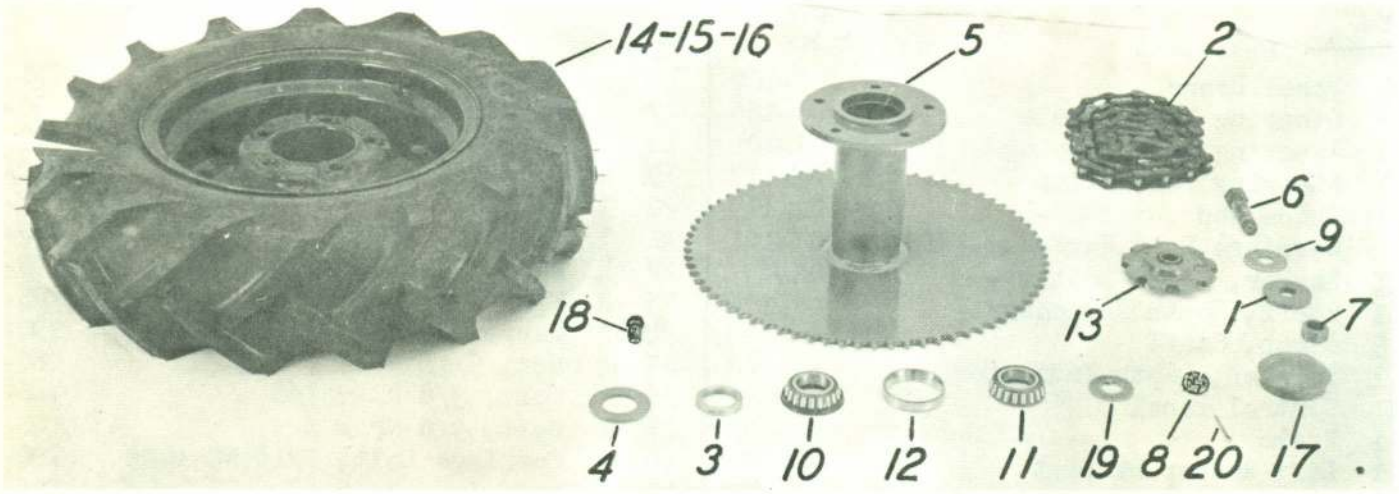
Index No.	No. Req.	Description	Part No.
1	1	Panel Brace	DJ-102
2	1	Steering Lock Handle	DJ-105
3	1	Steering Lock Bushing	DJ-106
4	1	Steering Post Clamp	DJ-117
5	1	Guide Rod	DJ-119
6	1	Carriage Bolt,Hardened,7/16NCx3	DJ-121
7	1	Marker, Depth Indicator	DJ-123
8	1	Staff, Depth Indicator	DJ-124
9	3	Clamp, Staff	DJ-125
10	1	Pointer, Depth Indicator	DJ-126
11	1	Control Panel	DJ-141
12	1	Frame	DJ-152
13	1	Lift Anchor Bracket	DJ-153
14	2	Clamp, Deflector	DJ-457
15	1	Nut, 3/8 NF	TDS-35
16	1	Cotter Pin, 1/8 x 1	TDS-57
17	3	Lockwasher, 3/8	TDS-79
18	1	Grease Fitting, $\frac{1}{4}$ SAE	TDS-93
19	4	Lockwasher, 5/16	TDS-107
20	3	Nut, 3/8 NC	TDS-117
21	1	Wing Nut, $\frac{1}{4}$ NC	TDS-121
22	4	Bolt, 5/16 NC x 3/4	TDS-249
23	2	Wing Nut, 3/8 NC	TDS-297
24	1	Carriage Bolt, $\frac{1}{4}$ NC x 3/4	TDS-349
25	4	Nut, 5/16 NC	TDS-353
26	1	Bolt, 3/8 NF x 7/8	TDS-383
27	1	Bolt, 3/8 NF x 1	TDS-408
28	1	Carriage Bolt, 7/16 NC x $2\frac{1}{2}$	TDS-424
29	2	Nut, Jam, 7/16 NC	TDS-425
30	3	Carriage Bolt, 3/8 NC x 1	TDS-427



Index No.	No. Req.	Description	Part No.
1	2	Plow Stop	DJ-115
2	1	Trench Side Spill Shield (Shown)	DJ-131LH
3	1	Trench Side Spill Shield (Not Shown)	DJ-131RH
4	4	Jam Nut, 3/8 NC	TDS-159
5	2	Bolt, 3/8 NC x 1	TDS-167
6	2	Wire-form Cotter, #2629	TDS-301

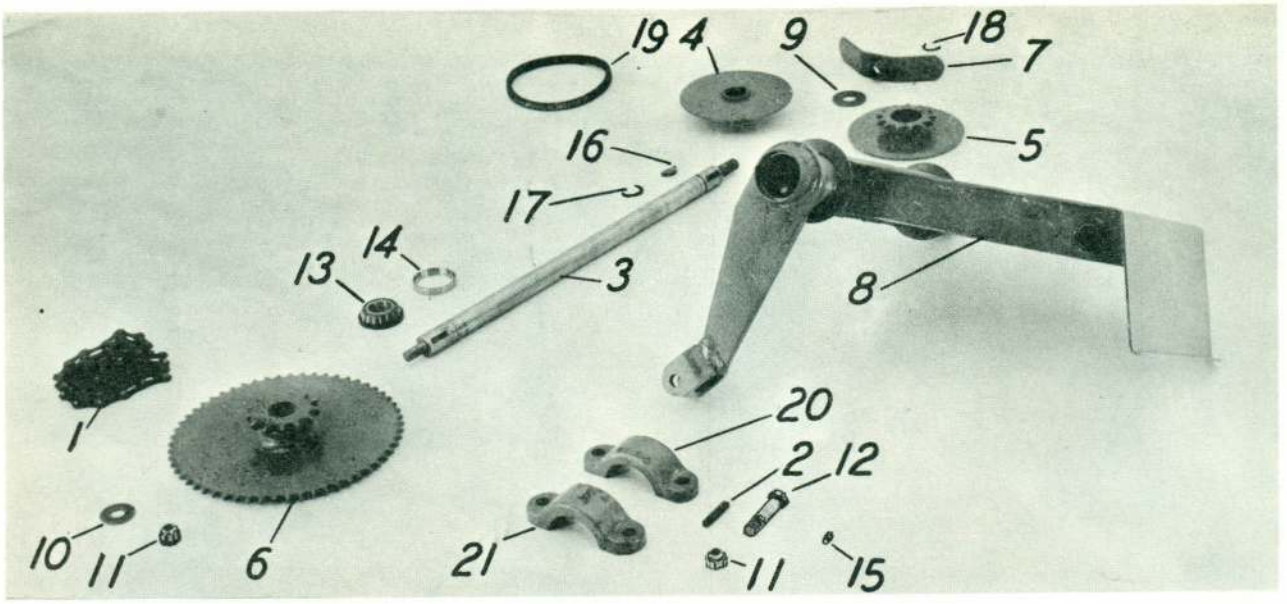
Index No.	Req.	Description	Part No.
1	1	Thrust Ring	DJ-551
2	1	Front Axle Assembly	DJ-561
3	1	Handle, Steer	DJ-570
4	1	Hook, Handle	DJ-573
5	3	Cotter Pin, 1/8 x 1¼	TDS-58
6	1	Cotter Pin, ¼ x 2½	TDS-65
7	2	Washer, 5/8 Wrought	TDS-85
8	1	Bolt, ½ NF x 3	TDS-130
9	1	Nut, ½ NF, Self-locking	TDS-210
10	2	Front Wheel. includes bearings, hub cap, grease seal, but no tire or tube.	TDS-329
11	2	Tire, 4:00x8 AutomotiveTread	TDS-330
12	2	Tube, 4:00x8	TDS-331
13	4	Bearing Cup #07196	TDS-332
14	4	Bearing Cone #07100	TDS-333
15	2	Grease Seal	TDS-334
16	2	Hub Cap	TDS-335
17	2	Slotted Nut, 5/8 NF	TDS-354





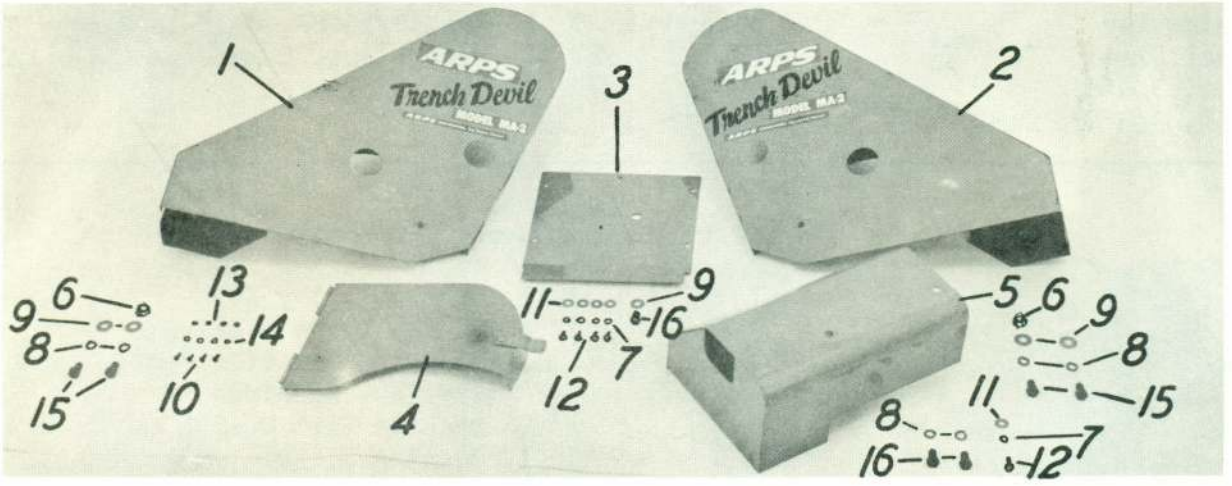
Index No.	Req.	Description	Part No.
1	2	Washer	DJ-107
2	2	Roller Chain, A2050, 59 P.	DJ-116
3	2	Spacer Ring	DJ-223
4	2	Hub Seal Disc	DJ-501
5	2	Wheel Hub, Rear	DJ-510
6	2	Bolt, 5/8 NF x 2¼	TDS-28
7	2	Nut, 5/8 NF	TDS-44
8	2	Nut, 3/4 NF Castle	TDS-50
9	2	Washer, 5/8 Wrought	TDS-85
10	2	Bearing Cone, LM67048L w/seal	TDS-309
11	2	Bearing Cone, LM67048 wo/seal	TDS-310
12	4	Bearing Cup, LM67010	TDS-312
13	2	Idler Sprocket, 1¼" Ext. P. Aetna AG-2416B	TDS-317
14	2	Wheels, 12 x 5 JA, Rear	TDS-324
15	2	Tire, 6-12, 2-Ply, open center traction tread	TDS-325
16	2	Tube, 6-12, w/hydra-flation valve	TDS-326
17	2	Hub Cap, Rear	TDS-327
18	10	Wheel Bolt, Rear Wheel	TDS-328
19	2	Washer, 3/4 InternallyKeyed	TDS-356
20	2	Cotter Pin, 3/16 x 1¼	TDS-358
*		Connector Link, A-2050	TDS-376
*		Offset Link, A-2050	TDS-377

* For repair of Chain (not shown)

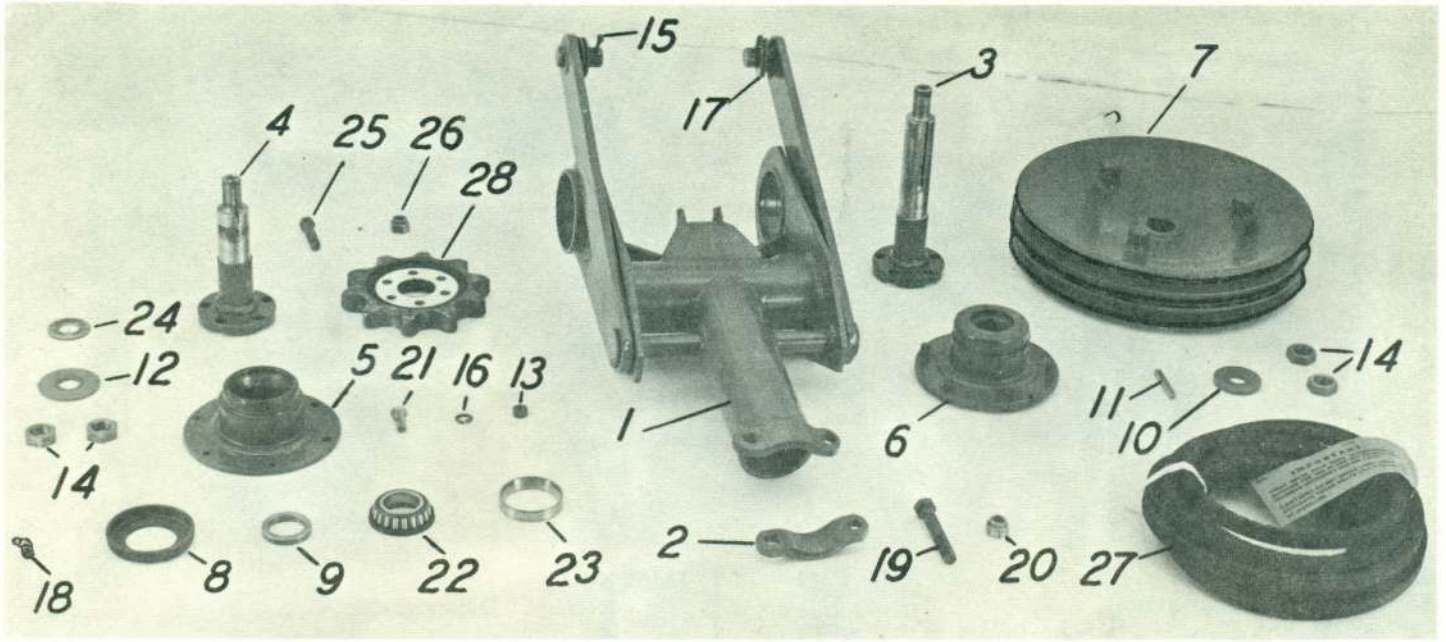


Index No.	Req.	Description	Part No.
1	1	Roller Chain A-2040, 47 P.	DJ-127
2	4	Felts, Pillow Block	DJ-235
3	1	Countershaft, long	DJ-237
4	1	Clutch face, plain	DJ-238
5	1	Clutch face, sprocket	DJ-239
6	1	Wheel drive Double Sprocket	DJ-240
7	1	Wing Nut, bent type	DJ-241
8	1	Lift Quadrant	DJ-242
9	1	Clutch Washer	DJ-243
10	1	Washer, ½ Wrought	TDS-83
11	5	Nut, ½ NF, Self-locking	TDS-210
12	4	Bolt, ½ NF x 2	TDS-262
13	2	Bearing Cone 07100L w/seal	TDS-311
14	2	Bearing Cup 07196	TDS-313
15	3	Grease Fitting, 5/16 Drive Angle type	TDS-314
16	2	Key, Woodruff #808	TDS-370
*	-	Connector Link, A-2040	TDS-374
*	-	Offset Link, A-2040	TDS-375
17	1	Retaining Ring, Nat.XSO-237	TDS-387
18	1	Retaining Ring, Nat.XSO-225	TDS-389
19	1	V-Belt, 4L180	TDS-390
20	2	Pillow Block, plain	TJ-35
21	2	Pillow Block, drilled	TJ-35A

* For repair of chain (not shown)

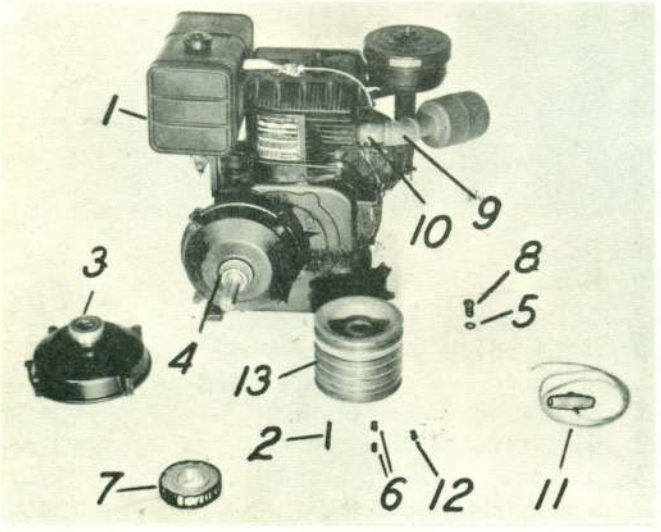


Index No.	Req.	Description	Part No.
1	1	Shroud, R.H. (Engine Pulley Side)	DJ-163
2	1	Shroud, L.H.	DJ-164
3	1	Back Panel	DJ-165
4	1	Pulley Shroud	DJ-166
5	1	Hood	DJ-167
6	2	Nut, 3/8 NF	TDS-35
7	5	Lockwasher, ¼	TDS-78
8	6	Lockwasher, 3/8	TDS-79
9	5	Washer, 3/8 Wrought	TDS-131
10	4	Machine Screw, #10-32 x ½, Oval Head	TDS-150
11	5	Washer, ¼ Wrought	TDS-221
12	5	Bolt, ¼ NC x ½	TDS-238
13	4	Nut, #10-32	TDS-296
14	4	Lockwasher, #10	TDS-298
15	4	Bolt, 3/8 NF x 1	TDS-408
16	2	Bolt, 3/8 NF x 3/4	TDS-426

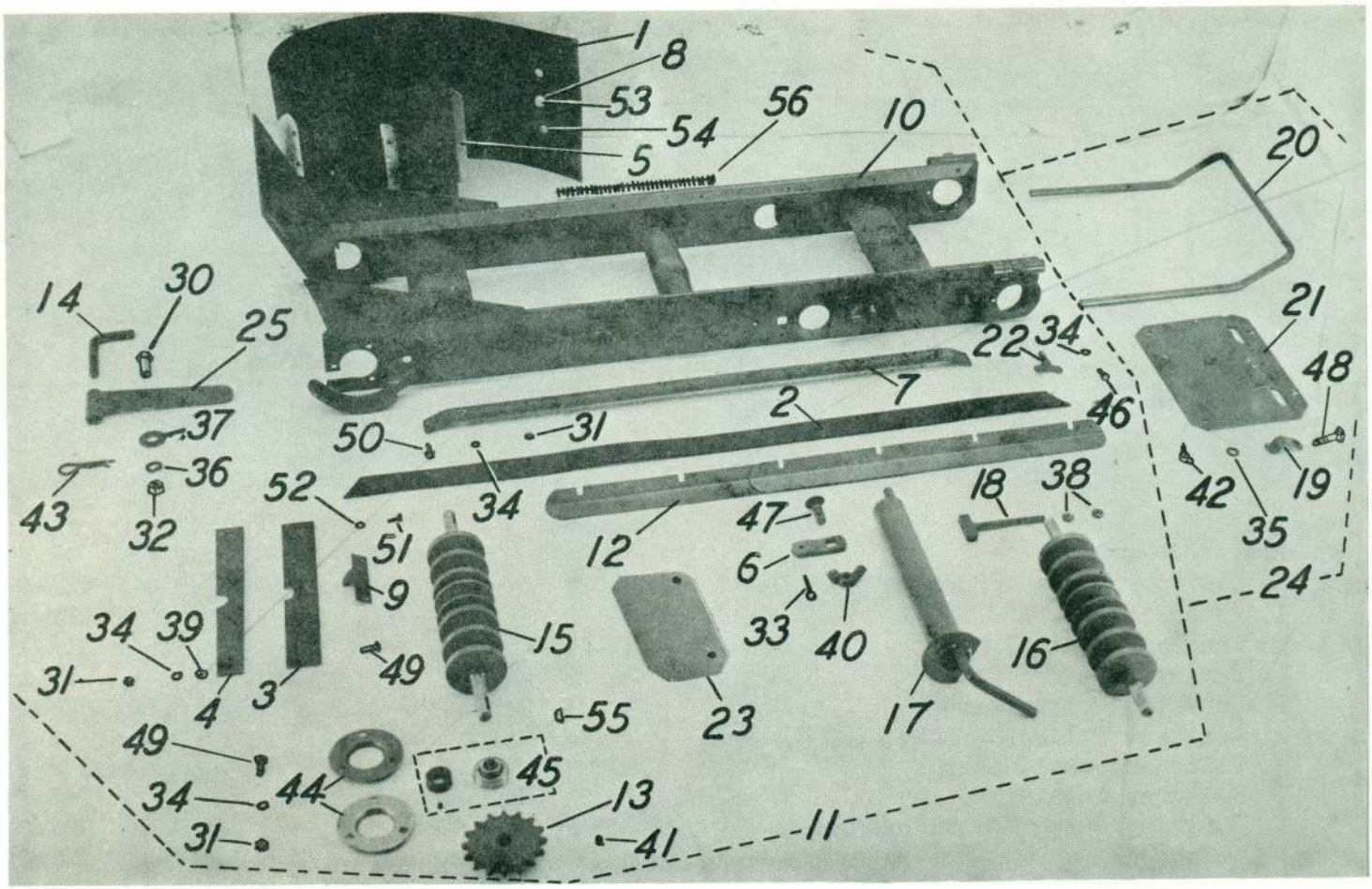


Index No.	Req.	Description	Part No.
1	1	Boom Base	DJ-203
2	1	Boom Clamp	DJ-204
3	1	Drive Shaft, Pulley end	DJ-211
4	1	Drive Shaft, Stub end	DJ-212
5	2	Bearing Holders, no bearings	DJ-220
6	2	Bearing Holders, complete with bearings	DJ-220A
7	1	Pulley, 2 C-groove	DJ-221
8	2	Seal Guard	DJ-222
9	3	Spacer Ring	DJ-223
10	1	Retaining Washer	DJ-224
11	1	Drive Key	DJ-225
12	1	Seal Disc	DJ-227
13	12	Nut, 3/8 NF	TDS-35
14	4	Nut, 3/4 NF, Jam	TDS-49

Index No.	Req.	Description	Part No.
15	2	Cotter Pin, 3/16 x 1½	TDS-62
16	12	Lockwasher, 3/8	TDS-79
17	4	Washer, 1-3/4 OD x 15/16 ID x 10 ga	TDS-88
18	2	Grease Fitting, 1/8 NPT x 67½°	TDS-92
19	2	Bolt, ½ NF x 3	TDS-130
20	2	Nut, ½ NF, Self-locking	TDS-210
21	12	Bolt, 3/8 NF x 7/8	TDS-287
22	4	Bearing Cone LM67048L w/seal	TDS-309
23	4	Bearing Cup LM67010	TDS-312
24	1	Washer 3/4 Internally Keyed	TDS-356
25	6	Bolt, 7/16 NF x 1-3/4, H.T.	TDS-412
26	6	Nut, 7/16 NF, Self-locking	TDS-413
27	1	V-Belt Set, 2 matched C-75	TDS-498
28	1	Drive Sprocket	TJ-33

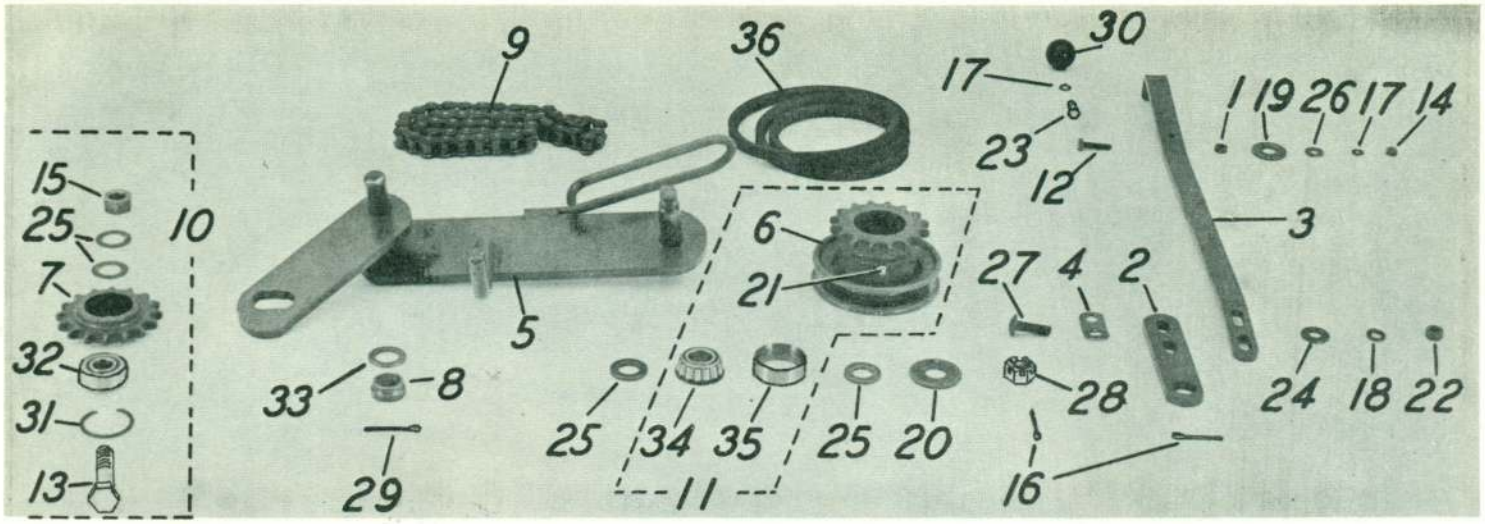


Index No.	Req.	Description	Part No.
1	1	Engine	- - - -
2	1	Engine Pulley Key	DJ-252
3	1	Engine Drive Housing, Briggs & Stratton Part #291354, machined to receive Part DJ-254	DJ-253
4	1	Bearing Sleeve	DJ-254
5	4	Lockwasher, 3/8	TDS-79
6	2	Setscrew, 5/16 NC x ½ Socket Drive, Cup Point	TDS-153
7	1	Bearing, Fafnir 9112P	TDS-308
8	4	Bolt, 3/8 NF x 1¼	TDS-337
9	1	Pipe Elbow, 1" x 45°	TDS-415
10	1	Pipe Nipple, 1" x 3	TDS-416
11	1	Starting Rope, Briggs & Stratton #69932	TDS-417
12	1	Grease Fitting, 5/16 Drive	TDS-442
13	1	Engine Pulley, C-groove	TJ-36C



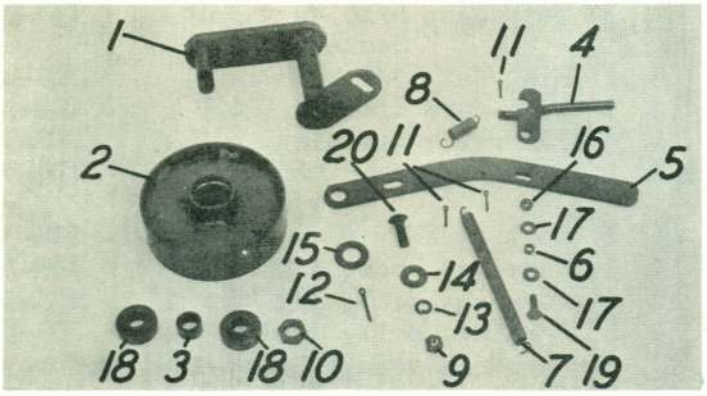
Index No.	No. Req.	Description	Part No.
1	1	Conveyor Belt, assembled, ready to use	DJ-401
2	2	Side Strip Belting	DJ-402
3	1	Wiper Strip Belting	DJ-403
4	2	Scraper, Roller	DJ-404
5	14	Angle Cleats for Conveyor Belt	DJ-405
6	1	Clamp	DJ-406
7	4	Slide Rail	DJ-407
8	14	Belt Guide Button	DJ-410
9	2	Roller Groove Scraper	DJ-412
10	1	Conveyor Frame, Weldment only, Stripped	DJ-415
11	1	Conveyor completely assembled w/Conveyor Belt, Sprockets, etc. but less Dirt Deflector	DJ-415A
12	2	Anti-spill Strip	DJ-416
13	2	Sprocket	DJ-417
14	1	Conveyor Lock Pin	DJ-418
15	1	Drive Roller	DJ-421
16	1	Idler Roller	DJ-430
17	1	Cam	DJ-440
18	1	Cam Adjusting Tee	DJ-450
19	2	Deflector Clamp	DJ-457
20	1	Deflector Rod, long	DJ-458
21	1	Deflector Flap, no swinging	DJ-459
22	2	Thumbscrew	DJ-460
23	1	Stone Flap	DJ-461
24	1	Deflector Flap, complete; Clamp, Rod, and Hardware	DJ-465
25	2	Conveyor Lock	DJ-470

Index No.	No. Req.	Description	Part No.
30	2	Bolt, $\frac{1}{2}$ NC x $1\frac{1}{4}$	TDS-4
31	18	Nut, $\frac{1}{4}$ NC	TDS-34
32	2	Nut, $\frac{1}{2}$ NC	TDS-40
33	1	Cotter Pin, 3/16 x 1	TDS-61
34	24	Lockwasher, $\frac{1}{4}$	TDS-78
35	2	Lockwasher, 3/8	TDS-79
36	2	Lockwasher, $\frac{1}{2}$	TDS-82
37	2	Washer, $\frac{1}{2}$ Wrought	TDS-83
38	2	Nut, 3/8 NC Jam	TDS-159
39	4	Washer, $\frac{1}{4}$ Wrought	TDS-221
40	1	Wing Nut, $\frac{1}{2}$ NC	TDS-226
41	2	Setscrew, 5/16 NC x 5/16 Socket Drive	TDS-291
42	2	Wing Nut, 3/8 NC	TDS-297
43	1	Wire-form Cotter, #2629	TDS-301
44	8	Flangette Stamping, 40MSC1	TDS-303
45	4	Bearing, Fafnir RA010PPB w/collar	TDS-304
46	6	Bolt, $\frac{1}{4}$ NF x $\frac{1}{2}$	TDS-340
47	1	Carriage Bolt, $\frac{1}{2}$ NC x $1\frac{1}{2}$	TDS-344
48	2	Carriage Bolt, 3/8 NC x $1\frac{1}{4}$	TDS-347
49	4	Carriage Bolt, $\frac{1}{4}$ NC x 3/4	TDS-349
50	8	Machine Screw, $\frac{1}{4}$NCx7/8, Flat Hd.	TDS-351
51	23	Machine Screw, #10B x $\frac{1}{2}$ Hex Self-tapping	TDS-352
52	43	Washer, #10 Wrought	TDS-357
53	14	Rivet, $\frac{1}{4}$x7/8, Countersunk Hd.	TDS-360
54	28	Rivet, $\frac{1}{4}$ x 3/8, Truss Head	TDS-361
55	2	Key, Woodruff #607	TDS-365
56	-	Belt Lacing, Alligator #15	TDS-373

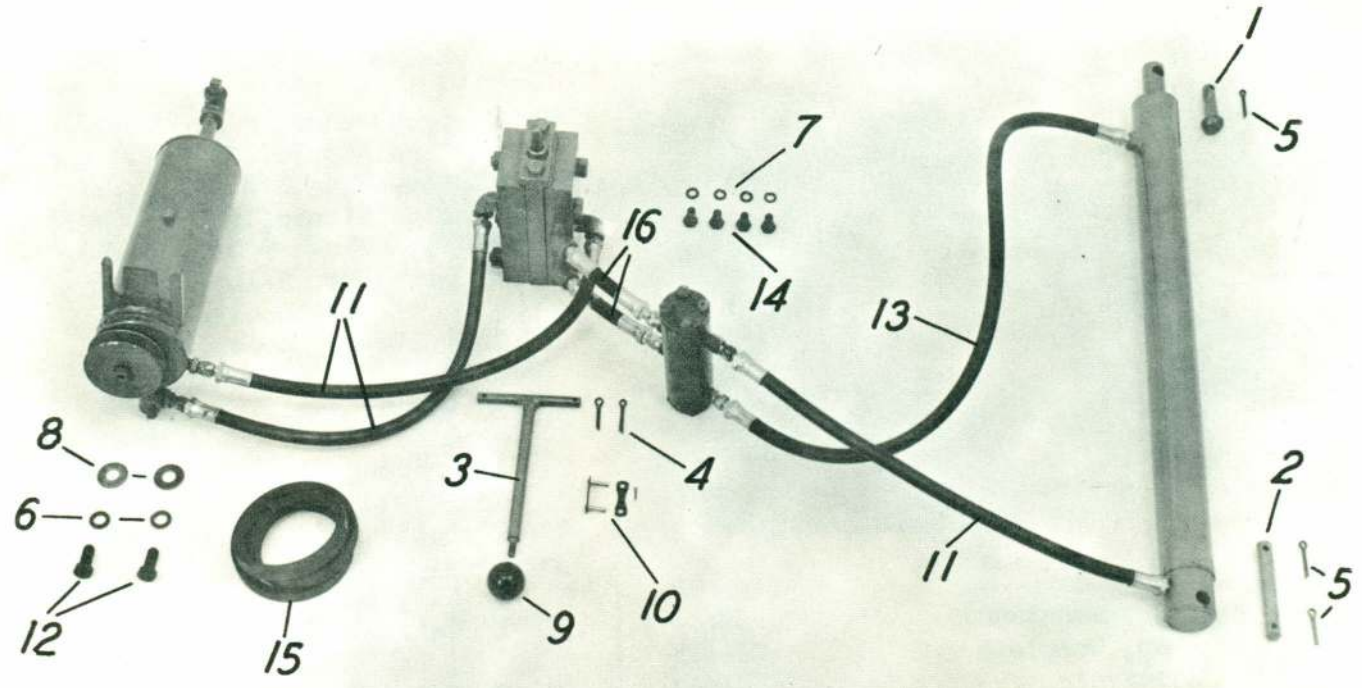


Index No.	Req.	Description	Part No.
1	1	Conveyor Control Bushing	DJ-104
2	1	Extension Bar	DJ-113
3	1	Conveyor Control Bar	DJ-114
4	1	Spring Clip	DJ-118A
5	1	Conveyor Drive Frame	DJ-476
6	1	Conveyor Pulley-Sprocket only	DJ-477
7	1	Idler Sprocket, only	DJ-478
8	1	Retainer Bushing	DJ-479
9	1	Conveyor Drive Chain, 5/8 P. 60 Pitches	DJ-480
10	1	Idler Sprocket, w/Bearings, Washers, and Bolt	DJ-485
11	1	Conveyor Pulley - Sprocket w/Bearing, Cup and Cone	DJ-490
12	1	Bolt, $\frac{1}{4}$ NC x $1\frac{1}{4}$	TDS-17
13	1	Bolt, 5/8 NF x $2\frac{1}{4}$	TDS-28
14	1	Nut, $\frac{1}{4}$ NC	TDS-34
15	1	Nut, 5/8 NF	TDS-44
16	1	Cotter Pin, 1/8 x $1\frac{1}{4}$	TDS-58
17	2	Lockwasher $\frac{1}{4}$	TDS-78
18	2	Lockwasher 3/8	TDS-79
19	1	Washer, $\frac{1}{2}$ Wrought	TDS-83
20	1	Washer, 5/8 Wrought	TDS-85
21	1	Grease Fitting, $\frac{1}{4}$ SAE	TDS-93
22	2	Nut, 3/8 NC	TDS-117
23	1	Bolt, $\frac{1}{4}$ NC x 1	TDS-118
24	2	Washer, 3/8 Wrought	TDS-131
*	-	Connector Link, 5/8 P.	TDS-171
*	-	Offset Link, 5/8 P.	TDS-177
25	2	Washer, 11/16 IDx$1\frac{1}{4}$ ODx10 ga	TDS-211
26	1	Washer, $\frac{1}{4}$ Wrought	TDS-221
27	2	Carriage Bolt, 3/8 NCx$1\frac{1}{4}$	TDS-347
28	1	Slotted Nut, 5/8 NF	TDS-354
29	1	Cotter Pin, 3/16 x $1\frac{1}{4}$	TDS-358
30	1	Handle Knob, $1\frac{1}{4}$ dia. x $\frac{1}{4}$ NC	TDS-371
31	1	Retaining Ring, 1-45/64 x 1-29/64 x .042	TDS-418
32	1	Bearing, Ball, Fafnir RA010PP, wo/collar	TDS-419
33	-	Washer, 3/4 IDx$1\frac{1}{4}$x14 ga	TDS-420
34	2	Bearing Cone, LM-11949L w/seal	TDS-421
35	2	Bearing Cup, LM-11910	TDS-422
36	1	V-Belt, AX-51 Dayton	TDS-441

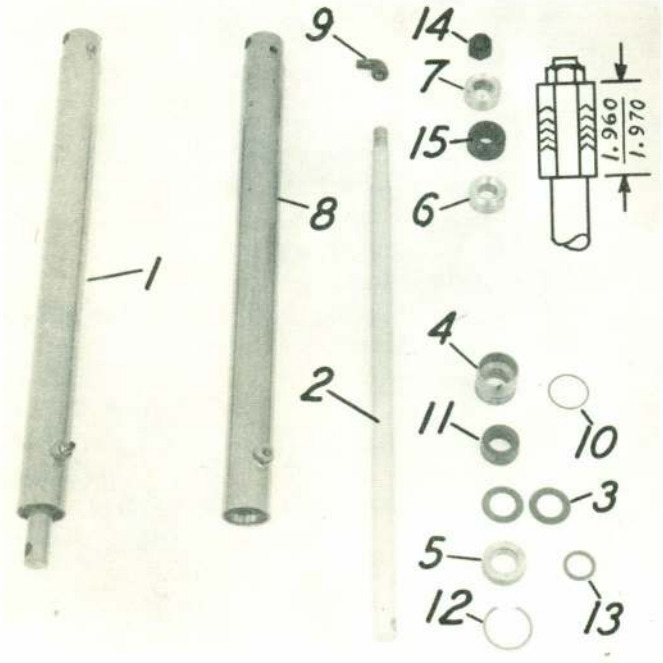
* For repair of Chain (not shown)



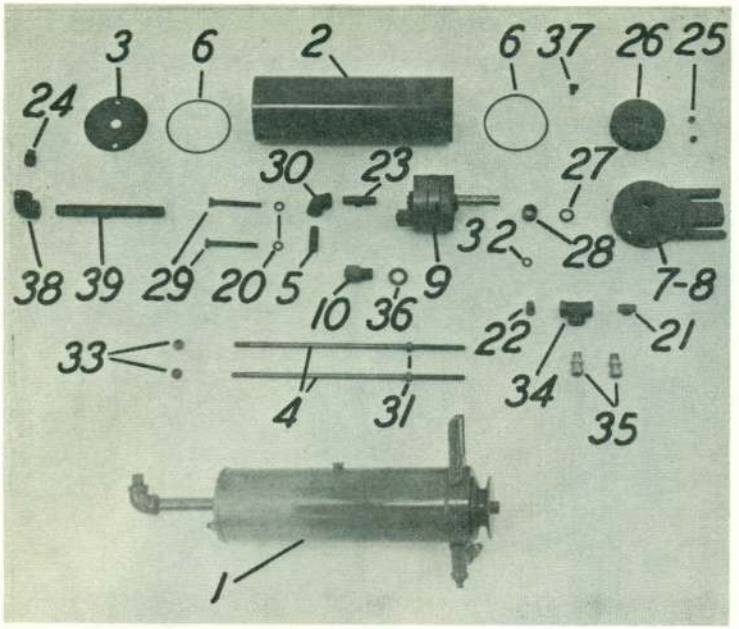
Index No.	Req.	Description	Part No.
1	1	Belt Tensioner Weldment, Main	DJ-283
2	1	Idler Pulley less Bearings	DJ-284
3	1	Bearing Spacer	DJ-285
4	1	Handle Latch	DJ-286
5	1	Handle	DJ-287
6	1	Latch Spacer	DJ-288
7	1	Spring, Main Tensioner	DJ-289
8	1	Spring, Latch	DJ-304
9	1	Nut, $\frac{1}{2}$ NF	TDS-39
10	1	Nut, 7/8 NF Jam	TDS-53
11	3	Cotter Pin, 1/8 x 1	TDS-57
12	1	Cotter Pin, 3/16 x $1\frac{1}{2}$	TDS-62
13	1	Lockwasher $\frac{1}{2}$	TDS-82
14	1	Washer, $\frac{1}{2}$ Wrought	TDS-83
15	-	Washer, 1-3/40Dx15/16IDx10ga	TDS-88
16	1	Nut, 3/8 NC	TDS-117
17	2	Washer, 3/8 Wrought	TDS-131
18	2	Bearing, Ball, Fafnir RA014PP wo/collar	TDS-307A
19	1	Carriage Bolt, 3/8 NC x $1\frac{1}{4}$	TDS-347
20	1	Bolt, $\frac{1}{2}$ NF x $1\frac{1}{2}$	TDS-493



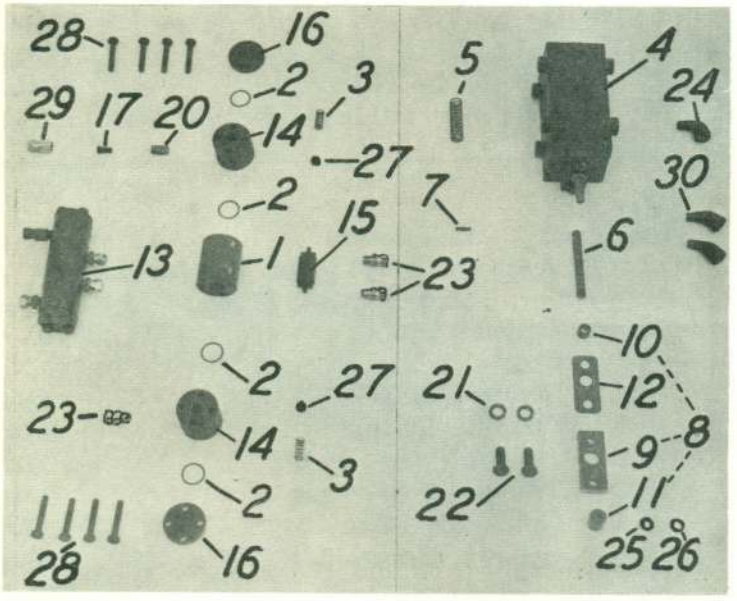
Index No.	Req.	Description	Part No.
1	1	Pin, Piston Rod Anchor	DJ-601
2	1	Pin, Cylinder Base	DJ-602
3	1	Valve Handle	DJ-610
4	2	Cotter Pin, 1/8 x 1	TDS-57
5	3	Cotter Pin, 3/16 x 1	TDS-61
6	2	Lockwasher 3/8	TDS-79
7	4	Lockwasher 5/16	TDS-107
8	2	Washer, 3/8 Wrought	TDS-131
9	1	Knob, $1\frac{1}{4}$ dia. x $\frac{1}{4}$ NC	TDS-371
10	1	Connector Link A-2040	TDS-374
11	3	Hose, Hydraulic, 1/8 NPT x 16, Male	TDS-407
12	2	Bolt, 3/8 NF x 1	TDS-408
13	1	Hose, Hydraulic, 1/8 NPT x 28, Male	TDS-410
14	4	Bolt, 5/16 NC x $\frac{1}{2}$	TDS-411
15	1	Vee Belt, 4L340	TDS-440
16	2	Hose, Hydraulic 1/8NPTx4 Male	TDS-443



Index No.	Req.	Description	Part No.
1	1	Hydraulic Cylinder Complete (Less Street Elbow)	DJ-630
2	1	Piston Rod	DJ-631
3	-	Shim	DJ-632
4	1	Gland Guide	DJ-633
5	1	Guide Bushing	DJ-634
6	1	Piston Ring, Male	DJ-635
7	1	Piston Ring, Female	DJ-636
8	1	Cylinder Tube	DJ-637
9	1	Street Elbow, 1/8 NPT x 90°	TDS-409
10	1	O-Ring, 3355-28	TDS-432
11	1	Packing Set, Chevron w/adapters, 7/8 IDx1-3/8 OD x .703 stack height, Periflex	TDS-433
12	1	Retaining Ring, Internal 1.703 ODx5/32x.062	TDS-434
13	1	Tetra Seal, 13/16 IDx1/8sq.sec	TDS-435
14	1	Nut, 5/8 NF, Self-locking	TDS-436
15	1	Packing Set, Chevron wo/adapters, 4 each 3/4ID x $1\frac{1}{2}$ OD, Periflex	TDS-437



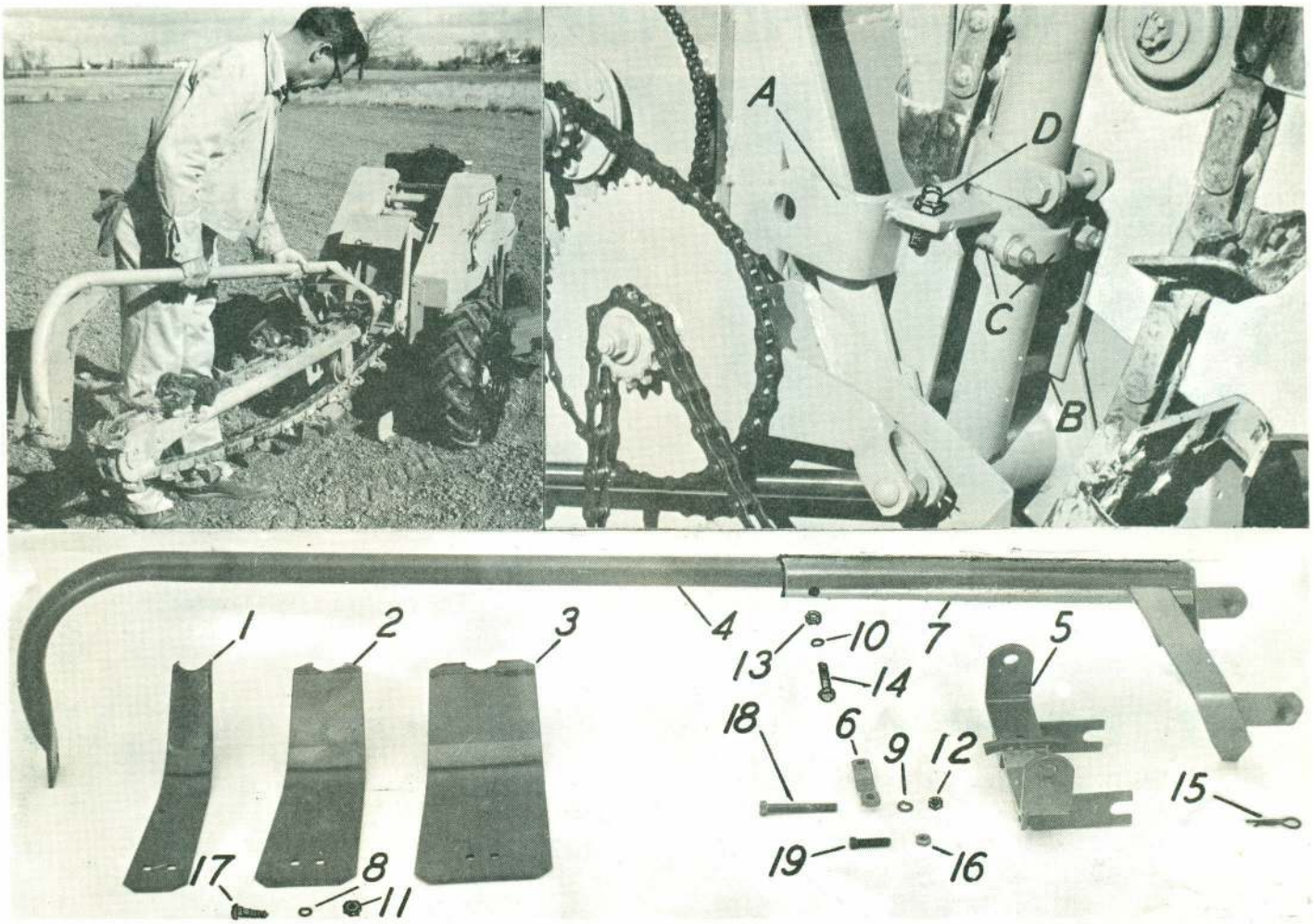
Index No.	Req.	Description	Part No.
1	1	Pump, Complete	DJ-620
2	1	Reservoir	DJ-621
3	1	End Cap	DJ-622
4	2	Stud	DJ-623
5	1	Suction Tube	DJ-624
6	2	Reservoir Gasket	DJ-625
7	1	Pump Head- No Seal,No Brg.	DJ-627
8	1	Pump Head- w/seal & Bearing	DJ-627A
9	1	Pump, w/relief set at 1700 psi	DJ-628
10	1	Relief Valve,Set at 1700psi	DJ-629
20	2	Lockwasher $\frac{1}{4}$	TDS-78
21	1	Pipe Nipple,1/8 NPT,Close	TDS-95
22	1	Pipe Plug,1/8 NPT,Sq.Hd.	TDS-136
23	1	Pipe Nipple,1/8 NPT,Short	TDS-248
24	1	Pipe Plug, $\frac{1}{4}$ NPT, Sq.Hd.	TDS-258
25	2	Setscrew, 5/16 NCx5/16 Socket drive	TDS-291
26	1	Pulley, $\frac{1}{2}$ Bore, AS-25 Browning	TDS-397
27	1	Grease Seal,Trostel EB-44-32-2	TDS-398
28	1	Bearing,Needle Torrington B-88	TDS-399
29	2	Bolt, $\frac{1}{4}$ NFx2$\frac{1}{4}$ H.T.	TDS-400
30	1	Pipe Elbow,1/8 NPT, 90°	TDS-401
31	2	Nut, $\frac{1}{4}$ NF	TDS-402
32	1	Tetra Seal, 5/16 OD x 1/16 Cross section	TDS-403
33	2	Nut,$\frac{1}{4}$ NF,#29E048 Esna	TDS-404
34	1	Pipe Tee, 1/8 NPT	TDS-405
35	2	Adapter Union,1/8 NPT,M-F	TDS-406
36	1	Gasket,Relief Valve9/16ID	TDS-488
37	1	Vent, Breather	TDS-489
38	1	Pipe Elbow, $\frac{1}{4}$ NPT, 90°	TDS-490
39	1	Pipe Nipple, $\frac{1}{4}$ NPT x 3$\frac{1}{2}$	TDS-491



Index No.	Req.	Description	Part No.
1	1	Body - Shuttle Spool	DJ-641
2	4	Gasket Ring	DJ-644
3	2	Check Ball Spring	DJ-647
4	1	Valve,Complete,Less Elbows	DJ-650
5	1	Valve Spring,Internal Part	DJ-656
6	1	Valve Rod	DJ-657
7	1	Valve Rod Pin, Internal Part	DJ-658
8	1	Guide Block Group,Assembled	DJ-660
9	1	Base Block	DJ-661
10	1	Valve Rod Bushing	DJ-662
11	1	O-Ring Cap	DJ-663
12	1	Plate Gasket	DJ-664
13	1	Shuttle Valve Complete w/fittings&restriction plug	DJ-670
14	2	Body - Check Ball	DJ-671
15	1	Shuttle Spool	DJ-672
16	2	End Closure Disc	DJ-673
17	1	Restriction Plug	DJ-674
20	1	Pipe Nipple, 1/8 NPT Close	TDS-95
21	2	Lockwasher 5/16	TDS-107
22	2	Bolt 5/16 NF x 1	TDS-338
23	3	Adapter Union,1/8 NPT,M-F	TDS-406
24	2	Street Ell, 1/8 NPTx90°	TDS-409
25	1	O-Ring, 1820-7	TDS-438
26	1	Tetra Seal,3/8 ID x 1/16 Cross Section	TDS-439
27	2	Ball, 3/8 dia. Steel	TDS-445
28	8	Bolt, $\frac{1}{4}$ NF x 2	TDS-448
29	1	Adapter Union,1/8 NPT F-F	TDS-449
30	2	Street Ell, 1/8 NPTx45°	TDS-492

CRUMBER ACCESSORY

FOR MODEL M & M-A TRENCHERS



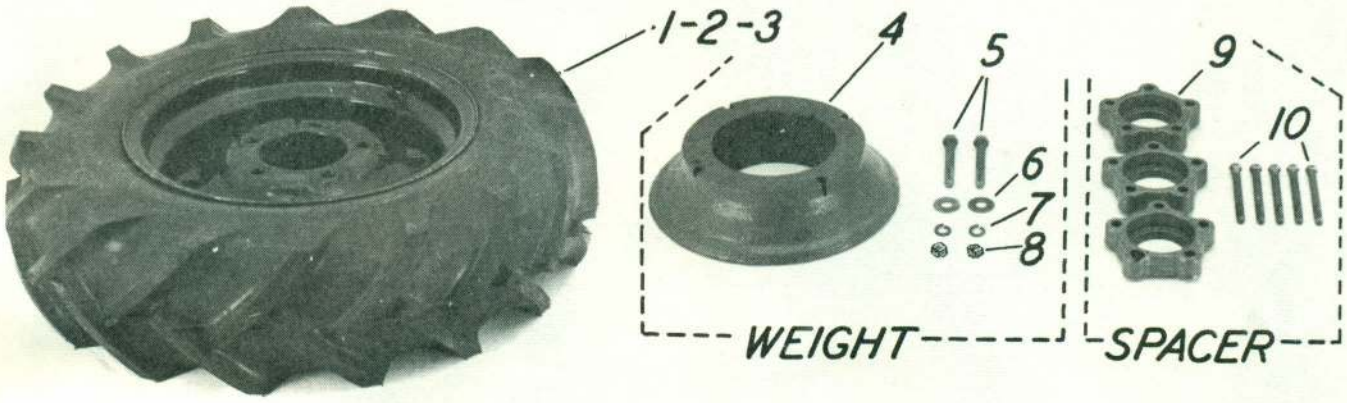
TO INSTALL CRUMBER - Place bracket "A" (above) on top side of boom socket so that forks engage cross shaft at "B". Apply bolts and clamp bar "C". Tighten bolts securely. Bolt proper width blade to end of crumber frame tube as shown in photo. Hook crumber frame to bracket "A" by sliding crumber frame pins through holes in bracket in manner shown in photo. One of the pins is then locked by a hairpin type cotter. Slip crumber frame tube into channel member of crumber frame until crumber blade clears cutters at boom end by approximately 1 to 1½". Clamp crumber frame tube tightly in place, being sure that the crumber blade is perfectly upright. With trencher boom lowered to position where cutters just contact the ground, adjust setscrews "D" (both sides evenly) until all weight of the crumber is against them, but with crumber blade also just contacting the ground. When so adjusted, trencher boom may be raised or lowered with the chain in motion with a minimum of hooking danger.

TO REMOVE CRUMBER - Merely pull out the hairpin cotter and slide crumber frame off bracket "A". Do not remove bracket "A". Note - Bracket "A" will lessen the height slightly to which the boom may be raised.

1	Crumber Blade 4"	DJ-1001	11	Nut, 3/8 NC	TDS-117
2	Crumber Blade 6"	DJ-1002	12	Nut, 7/16 NC	TDS-141
3	Crumber Blade 8"	DJ-1003	13	Nut, 5/16 NC	TDS-214
4	Crumber Frame Tube	DJ-1004	14	Bolt, 5/16 NC x 2¼	TDS-234
5	Mounting Bracket	DJ-1100	15	Wire-form Cotter #2629	TDS-301
6	Clamp Strap	DJ-1120	16	Jam Nut, ½ NC	TDS-382
7	Crumber Frame	DJ-1201	17	Carriage Bolt, 3/8 NC x 1	TDS-427
8	Lockwasher, 3/8	TDS-79	18	Bolt, 7/16 NC x 3½	TDS-428
9	Lockwasher, 7/16	TDS-81	19	Setscrew, ½ NC x 1¼ Square Head	TDS-429
10	Lockwasher, 5/16	TDS-107			

DUAL WHEEL AND WEIGHT ACCESSORY

FOR MODEL M-A TRENCHERS ONLY



Extra Wheels, Spacers, and Weights may be set up as follows:

1. Dual wheels only.
2. Dual wheels with single weight on inside wheel only.
3. Dual wheels with single weight on outside wheel only.
4. Dual wheels with double weights; weight on inside and outside wheel.
5. Weight only on single wheel. (For M & M-A Trenchers)

Note: Weight always assembles with taper end into back side of wheel.
Outer wheel of duals always has its back side toward the outside. Besure the tire tread runs in the proper direction.

No. 9 (TDS 430) replaced by DJ-521 (two pieces, one per wheel required for complete set)

Parts List

No.1	Wheel, 12x5 JA, Rear Wheel	TDS-324	No.6	Wrought Washer ½	TDS-83
2	Tire 6-12, 2-Ply Open Center Traction Tread	TDS-325	7	Lockwasher ½	TDS-82
3	Tube 6-12 w/Hydraflation Valve	TDS-326	8	Nut ½ NC	TDS-40
4	Wheel Weight	TDS-323	9	Wheel Spacer (Set of 3 req'd per wheel)	TDS-430
5	Bolt ½ NC x 4½	TDS-137	10	Wheel Spacer Bolt (Set of 5 req'd per wheel)	TDS-431

Products for Better Farms, Better Industries since 1920

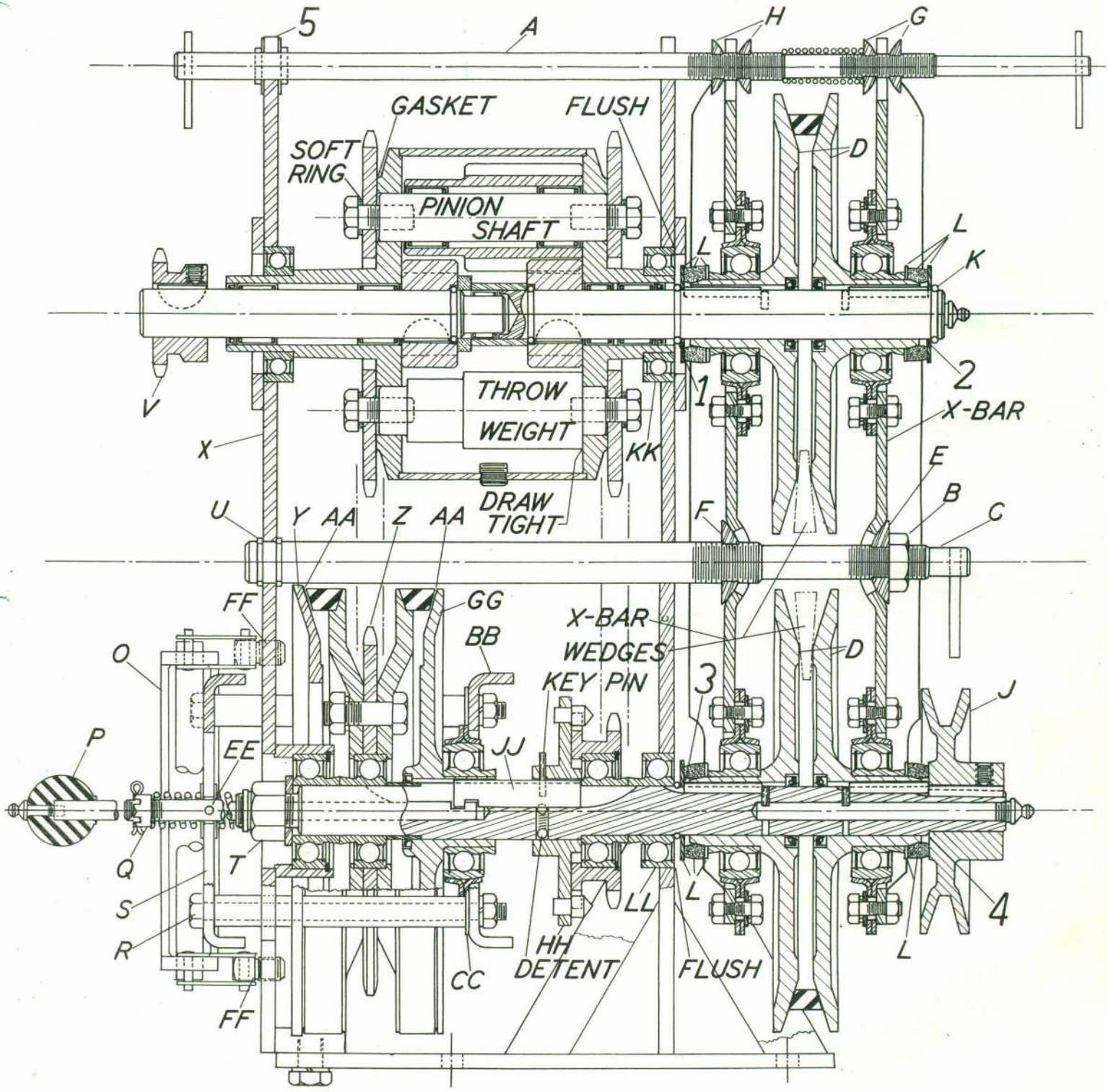
ARPS CORPORATION NEW HOLSTEIN, WISCONSIN

591

Litho in U.S.A.

MA 2 160

TRANSMISSION ASSEMBLY



FOR LONG LIFE–

USE MINIMUM TENSION ON VARIABLE BELT.
LUBRICATE VARIABLE SHEAVES OFTEN.
OPERATE VARIABLE SHEAVES THROUGH FULL RANGE OFTEN.

ARPS CORPORATION, NEW HOLSTEIN, WISCONSIN

MT I 160

GENERAL ADJUSTMENTS - REPAIR

REPAIR PARTS SECTION

1. TO CHANGE THE VARIABLE DRIVE BELT

a. Remove the small Hood-cover at the top without disturbing the speed control screw (A).

b. Carefully lift speed control screw (A) out and put it aside so as not to disturb its present setting or adjustment.

c. Remove the drive V-Belt from engine to transmission.

d. Loosen locknut (B) - (Note, nut has left hand threads). Turn tensioner screw (C) about 2 to 2½ turns counter clockwise. As you do this, force the belt into the variable sheaves (D), both upper and lower, to spread them apart. Do not allow pivot blocks (E) and (F) to come out of their sockets, otherwise considerable extra adjusting will result.

e. Pull belt off at bottom first, then off of top sheave. Replace with new belt in similar manner.

f. Turn tensioner screw (C) clockwise to draw variable sheave halves together, rotating them as you do this. Continue until new belt is firm in tension, but do not overtension. Lock with locknut (B).

g. Replace speed control screw (A) by carefully turning screw so that control blocks (G) and (H) move uniformly apart or together until they drop into their notch in the X-bars. Next, carefully push or pull entire screw endways until it fits into the notch at the far end of the screw at (5).

h. Check the alignment of the upper and lower variable sheaves with a straightedge. Use straightedge on front and back sides of sheaves. Sheaves should be within 1/32" or less of being exactly in line with each other on their center lines. For long belt life, do not allow any greater shift or misalignment.

i. If the alignment is correct, replace the cover hood, otherwise proceed with section 1 above.

2. TO ALIGN VARIABLE SHEAVES

a. Remove variable drive belt and speed control screw (A) according to section 1 above.

b. Screw pivot blocks (E) and (F) apart until nearly at the end of the thread.

c. Wedge the variable sheave sides (D) apart (both the upper set and lower set) as far as they will go (about 7/16 to 1/2 inch) using a tapered piece of wood etc., for each. The sheave hubs will stop against rings at points, 1, 2, 3, and 4. Leave wedges in place.

d. Turn each pivot block, (E) and (F), individually up to its respective X-bar socket. Then turn tension screw (C) to draw them into their respective sockets. Both blocks should seat simultaneously at the bottom of their respective sockets. If not, advance the "tardy" block 1/2 turn and try again.

e. Carefully remove the wedge from between the spread variable sheave sides (D) and draw the sheaves together by turning tension screw (C) until the sheave halves just contact but have no pressure between them.

f. Using a straightedge to check, slide the upper variable sheave (D) in or out on its shaft until it is exactly in line with the lower set. Note, as you slide the upper set in one direction, the lower set will automatically slide the same amount in the opposite direction. The sheaves should be together and in line.

g. Take speed adjusting screw (A) and adjust it to fit in its proper place just as the X-bars are positioned now.

h. The variable sheaves and their two adjusting screws are in proper adjustment. Now proceed according to section 1 above for replacing the belt.

3. TO REPLACE VARIABLE SHEAVES

a. Remove speed control screw (A), handle or tension screw (C), locknut (B), and pivot block (E). Remove pulley (J). Remove retaining ring (K). Remove outer sponge seal-washer group (L), both upper and lower.

b. Pull out keys from hubs of outer variable sheave sides (D). Carefully begin to slide the outer X-bar with its two variable sheave halves off the unit. Considerable resistance will be encountered as the opposed lip of the grease seal inside each sheave hub passes over the grease grooves of its shaft. Turning the sheaves as you pull them across will help.

c. Slide the inner set of variable sheave halves and their X-bar off the unit. Less resistance will be encountered as their grease seals are not opposed to the direction of movement.

d. Examine shafts for wear and pitting. Polish off any brownish deposit. Shaft diameters should not be less than .874 inches at the point of greatest wear, otherwise rapid sheave wear can be expected of the second set.

e. Replace with new sheaves, unless shafts require replacing, by doing the reverse of the above procedure. Check the seals in the new sheave halves (new sheaves require new seals). Seal lips must point inward. Stake seals in place permanently by using a center punch and hammer to produce four punch marks very close to the edge of the hole where the seal is pressed in. This will prevent the hydraulic pressure of the grease gun from dislodging the seals.

Be sure sponge seal-washer group (L), keys, and X-bar are in proper place and carefully work on the inner set of sheaves. Since these seal lips are opposed, considerable resistance will be met.Use care so as not to damage them. Outer sheave halves will slide on easily. Add keys, X-bar, sponge seal-washer group (L), - (note, lower set next to pulley uses one less washer), pulley (J) and retaining ring (K).

f. Put on pivot block (E) with locknut (B) and press handle into tension screw (C). Refer to sec. 2 to align sheaves and sec. 1 to put on variable belt.

4. TO REPLACE CLUTCH BELTS

a. Remove clutch activating lever (O), knob (P), and studs (Q) along with the outer springs.

b. Remove speed control screw (A) (refer to section 1), four carrier bolts and spacer bushings (R), spring plate (S), shaft nut (T), retaining ring (U), sprocket (V), and the four bolts that fasten outer frame plate (X) to rest of the frame.

c. Pull off outer frame plate(X), brake disc (Y), and clutch-sprocket (Z), along with the two clutch belts. Disconnect the secondary drive chain to release clutch-sprocket (Z).

d. Replace with new belts and reassemble in reverse order back up to paragraph above. Do not assemble parts listed in paragraph (a), but refer to section 5 below.

5. TO ADJUST CLUTCHES

The clutch belts must release with sufficient clearance so that clutch-sprocket (Z) can spin without any appreciable belt drag.

a. Check existing clearance by centering carrier assembly (parts S, Y, and BB bolted solidly together with carrier bolts (R) and their spacers). Check point (AA) for each belt; clearance for each belt should be 1/32 inch. Carrier should move 1/16" total when moving from one belt engagement to the other. Add or remove shims at (CC) (four places) until clearance is correct and clutch sprocket (Z) can spin with no appreciable drag.

b. Add studs(Q) and their springs. Check carrier to see if it is centered and each belt has its 1/32" clearance. If not, determine whether studs (Q)

must be screwed in or out and how much. Note, the four springs on studs (Q) cause spring plate (S) to center on pin (EE) in studs (Q). Screwing the stud in or out causes the stopping point of spring plate (S) to change accordingly. **Move spring plate (S) by turning studs (Q)** to the correct position. Reassemble and check to be sure one stud has not been moved too much or too little, which will cause one end of the brake disc (Y) to drag while the opposite has sufficient clearance at (AA).

c. Put on the clutch activating lever (O) and note whether it is parallel to outer frame plate (X) when the carrier is centered. If it is not parallel, remove it and screw pivot bolts (FF) in or out the required amount.

d. Replace knob (P). Check push-pull linkage for proper movement according to section 6 below.

6. TO ADJUST CONTROL LINKAGE

The push-pull control linkage must be in such adjustment that the steering handle may be moved to either extreme position without preventing the clutch direction lever on the steering handle from properly engaging either clutch sufficiently to drive the machine. To do this, two nuts are found on the last push-pull rod where it terminates at the clutch activating lever (O). Reposition these nuts accordingly. If clearance at (AA) becomes excessive, linkage may "bottom" without engaging clutches sufficiently to drive the machine. Readjustment according to section 5 is then required.

7. GENERAL DISASSEMBLY

Step by step procedure will not be given here but various points of critical importance will be brought to attention. In general, follow the cross sectional drawing for sequence, etc.

a. GEAR BOX

Throw Weight - This part has the same general configuration as the roller pinion with its shaft, except that it is solid. It is put into the gear box with its position matching the diagonally opposite roller pinion. One throw weight will be drawn up solid to one end of the gear box and the remaining throw weight is drawn up solid to the other end of the gear box.

Pinion Shaft - These shafts are drawn up solid to one end (either end of the gear box). These bolts should be wired.

Sealing- All stationary shafts and studs are sealed between the plate sprocket and the end bell by neoprene gasket and soft metal rings under the bolt heads. The stud threads should be painted with a liquid sealer before applying nuts. The housing is sealed to the end bells by a good liquid or plastic sealer compound, also. The rotating shafts have conventional oil seals. Use care in working them over the grooves in the shafts.

b. LOWER SHAFT

In addition to section 3 & 4 which covers most of this disassembly, carefully pull off carrier plate (BB) with the clutch disc (GG). A small, thin wall sleeve is located under the clutch disc (GG) for the seal to slide on. Remove it carefully. Its ends are beveled to match the shaft shoulder radius and bearing inner race radius.

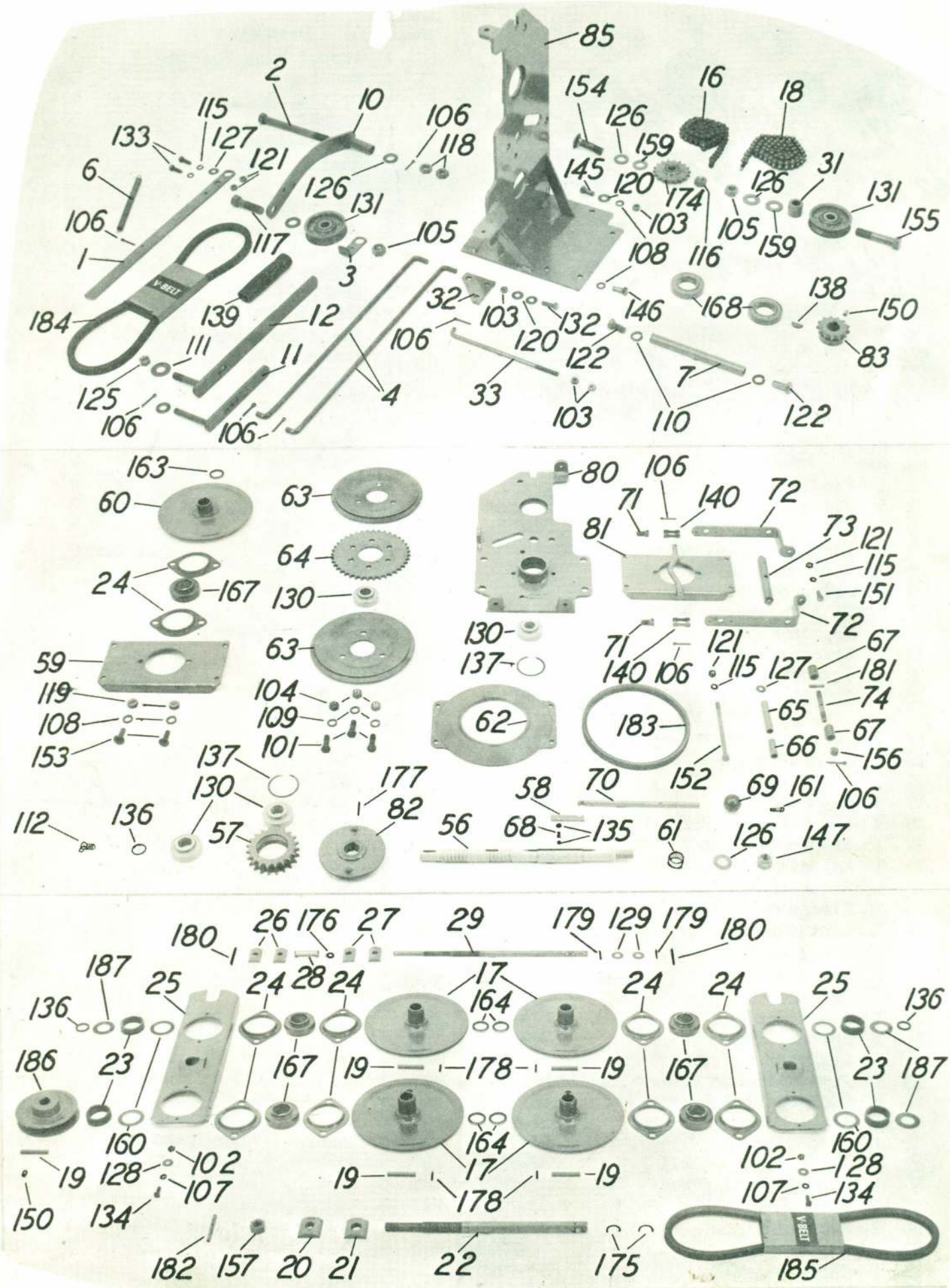
A key pin must be pulled before shift key (JJ) and shift coupler (HH) can be removed. Note the detent spring and two detent balls under the shift key.

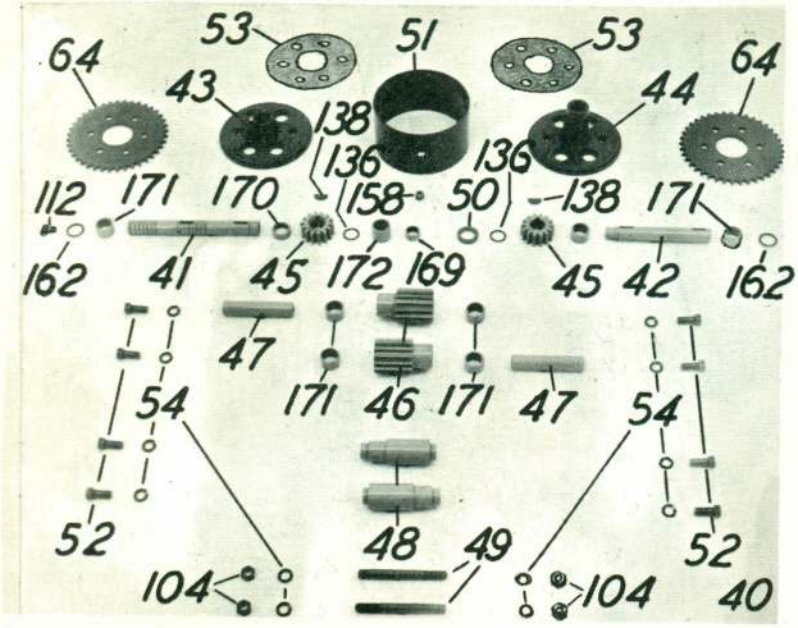
c. VARIABLE SHEAVE SHAFT KEYS

These keys are prevented from moving endways by a roll pin driven into the hole at one end of each keyway. Drive the pin down until it is just below the surface of the shaft.

d. VARIABLE SHEAVE SHAFT POSITION

Bearings (KK) and (LL) must be pushed into their sockets until flush withthe outside of the frame plate so that both shafts protrude through the correct amount for proper sheave action.


85
2
10
115
133
127
121
106
118
154
126
159
16
18
6
126
131
145
120
174
31
131
106
117
105
103
105
159
155
1
3
108
116
126
V-BELT
184
139
12
32
103
132
146
168
138
150
111
106
120
122
7
83
125
11
33
103
110
122
106
106
4
163
60
63
80
106
71
140
72
64
81
73
121
24
167
130
115
151
59
63
130
72
71
121
67
137
140
106
115
127
181
119
104
62
183
74
108
109
65
67
153
101
66
156
137
177
58
70
152
69
161
106
112
136
130
82
56
68
135
61
126
147
57
177
182
157
20
21
22
175
185
MT 5 160



Index No.	Req.	Description	Part No.
1	1	Handle	DJ-7001
2	1	Pivot Bolt	DJ-7002
3	1	Belt Clip	DJ-7003
4	2	Push-Pull Rod, Long	DJ-7004
6	1	Spring, Belt Tension	DJ-7006
7	2	Frame Spacer Tube	DJ-7007
10	1	Belt Tightener Bar	DJ-7020
11	1	Transport Handle, Short	DJ-7030
12	1	Transport Handle, Long	DJ-7040
15	1	Transmission complete	DJ-7100
16	1	Primary Input Chain, ½ P. 67 Pitches	DJ-7101
17	4	Variable Sheave Discs	DJ-7102
18	1	Secondary Input Chain, ½ P. 76 Pitches	DJ-7103
19	5	Key	DJ-7104
20	1	Pivot Nut, Outer	DJ-7105
21	1	Pivot Nut, Inner	DJ-7106
22	1	Adjusting Screw, Lower	DJ-7107
23	4	Neoprene Seal	DJ-7108
24	10	Flangette Stamping, 52MST	DJ-7109
25	2	Variable Linkage Bar	DJ-7110
26	2	Speed Control Nut, Outer	DJ-7111
27	2	Speed Control Nut, Inner	DJ-7112
28	1	Friction Spring	DJ-7113
29	1	Speed Control Screw	DJ-7114
31	1	Spacer, Idler Roller	DJ-7116
32	1	Quadrant	DJ-7117
33	1	Push-Pull Rod, Short	DJ-7118
40	1	Differential Gear Unit	DJ-7200
41	1	Input Shaft	DJ-7201
42	1	Output Shaft	DJ-7202
43	1	Input Housing Bell	DJ-7203
44	1	Output Housing Bell	DJ-7204
45	2	Gear	DJ-7205
46	2	Roller Pinion	DJ-7206
47	2	Pinion Shaft	DJ-7207
48	2	Throw Weight	DJ-7208
49	2	Stud	DJ-7209
50	1	Thrust Ring Bearing	DJ-7210
51	1	Housing	DJ-7211
52	4	Dr'l'd. Bolt, 7/16 NFx1	DJ-7212
53	2	Gasket Seal	DJ-7213
54	12	Compression Seal	DJ-7214
56	1	Shaft, Lower	DJ-7301
57	1	Sprocket - Coupling	DJ-7302
58	1	Shift Key	DJ-7303
59	1	Bearing Plate	DJ-7304
60	1	Drive Clutch Disc	DJ-7305
61	1	Sleeve	DJ-7306
62	1	Brake Clutch Disc	DJ-7307
63	2	Driven Clutch Disc	DJ-7308
64	3	Plate Sprocket, 40 T.	DJ-7309
65	4	Spacer, Long, Clutch	DJ-7310
66	4	Spacer, Short, Clutch	DJ-7311
67	4	Spring, Clutch	DJ-7312
68	1	Detent Spring	DJ-7313
69	1	Shift Knob	DJ-7314
70	1	Shift Rod	DJ-7315
71	2	Clutch Control Pivot	DJ-7316
72	2	Clutch Control Lever	DJ-7317
73	1	Pivot Bar	DJ-7318
74	2	Spring Stud	DJ-7319
80	1	Frame Panel	DJ-7350
81	1	Control Brkt., Clutch	DJ-7360
82	1	Shift Coupling	DJ-7370
83	1	Output Sprocket	DJ-322A
85	1	Frame	DJ-7400
101	7	Bolt, 7/16 NF x 1¼	TDS-23
102	8	Nut, ¼ NC	TDS-34
103	7	Nut, 3/8 NF	TDS-35
104	7	Nut, 7/16 NF	TDS-37
105	2	Nut, 5/8 NF	TDS-44
106	-	Cotter Pin, 1/8 x 1	TDS-57
107	8	Lockwasher, ¼	TDS-78
108	6	Lockwasher, 3/8	TDS-79
109	3	Lockwasher, 7/16	TDS-81
110	4	Lockwasher, ½	TDS-82
111	1	Washer, ½ Wrought	TDS-83
112	2	Grease Fit. 1/8 NPT 67½°	TDS-92
115	3	Lockwasher, 5/16	TDS-107
116	1	Nut, 5/8 NC	TDS-108
117	1	Bolt, 5/8 NF x 2	TDS-111
118	2	Jam Nut, 5/8 NF	TDS-114
119	2	Nut, 3/8 NC	TDS-117
120	4	Washer, 3/8 Wrought	TDS-131
121	3	Nut, 5/16 NF	TDS-140
122	4	Bolt, ½ NC x 1	TDS-155
125	1	Nut, ½ NF, Self-locking	TDS-210
126	-	Washer, 11/16x1¼x10 ga	TDS-211
127	5	Washer, 5/16 Wrought	TDS-212
128	8	Washer, ¼ Wrought	TDS-221
129	2	Washer, ½ SAE 17/32 x 1-1/16 x 13 ga	TDS-243
130	4	Bearing, Ball, Fafnir RA014PP, wo/collar	TDS-307A
131	2	Pulley, Aetna AG-2352	TDS-322

Index No.	No. Req.	Description	Part No.
132	1	Bolt, 3/8 NF x 1¼	TDS-337
133	2	Bolt, 5/16 NF x 1	TDS-338
134	8	Bolt, ¼ NC x 3/4	TDS-343
135	2	Steel Ball, 3/16 dia.	TDS-362
136	5	Retaining Ring,Nat.XRC-335	TDS-363
137	2	Retaining Ring,Eaton1080-2	TDS-366
138	3	Key, Woodruff, #607	TDS-365
139	1	Handle Bar Grip, Bicycle	TDS-372
140	2	Connector Link, A-2040	TDS-374
145	4	Bolt, 3/8 NF x 1	TDS-408
146	2	Bolt, 3/8 NF x 3/4	TDS-426
147	1	Nut, 5/8 NF,Self-locking	TDS-436
150	2	Setscrew, 5/16 NC x 3/8 Socket Hd.	TDS-450
151	1	Bolt, 5/16 NF x 7/8	TDS-451
152	4	Bolt, 5/16 NF x 5½	TDS-452
153	2	Carriage Bolt, 3/8 NCx3/4	TDS-453
154	1	Carriage Bolt, 5/8 NCx 2½	TDS-454
155	1	Bolt, 5/8 NF x 3¼	TDS-455
156	2	Nut, Slotted, 3/8 NF	TDS-456
157	1	Nut, LH Thread, 5/8 NC	TDS-457
158	1	Pipe Plug, ¼ NPT, Socket	TDS-458
159	-	Washer, 5/8 x 1¼ x 18 ga	TDS-459
160	4	Washer, 1¼ x 1-7/8x18 ga	TDS-460
161	1	Grease Fitting, ¼ Long	TDS-461
162	2	Seal,Trostel B108-56-2	TDS-462
163	1	Seal,TrostelB120A-100-25	TDS-463
164	4	Seal,TrostelBRS120A-56-4	TDS-464
167	5	Bearing, Ball, Fafnir RA103PPB2, wo/collar	TDS-467
168	2	Bearing,Fafnir 9107PP	TDS-468
169	1	Bearing,Torrington B-118	TDS-469
170	1	Bearing,Torrington B-148	TDS-470
171	7	Bearing,TorringtonB-1412	TDS-471
172	1	Sleeve,TorringtonIR-1416	TDS-472
174	1	Sprocket,Aetna AG-2318	TDS-474
175	2	Retain'g Ring,Nat.XS0231	TDS-475
176	1	Retain'g Ring,Nat.XRC323	TDS-476
177	1	Roll Pin, 3/32 x 3/4	TDS-477
178	4	Roll Pin, 1/8 x 3/8	TDS-478
179	2	Roll Pin, 1/8 x 3/4	TDS-479
180	2	Roll Pin, 1/8 x 1-3/4	TDS-480
181	4	Roll Pin, 5/32 x 5/8	TDS-481
182	1	Roll Pin, 3/16 x 2	TDS-482
183	2	V-Belt, Dayton, 5L250	TDS-483
184	1	V-Belt, Dayton, 5L390	TDS-484
185	1	V-Belt,Dayton BP38orBX38	TDS-485
186	1	Vee Pulley, A-B Groove 3/4 Bore, BC-44	TDS-486
187	3	Washer, 7/8x1-3/4x18 ga	TDS-487